Northern Front Range Air Quality Study Final Report
Volume C: Source Apportionment and Simulation Methods and Evaluation

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Preface

This document is a companion to the Northern Front Range Air Quality Study Final Report (Watson et al., 1998a). It documents the three mathematical simulation methods (i.e., chemical mass balance, aerosol equilibrium, transport) that were applied as part of the data analysis and provides greater detail on the formulations of these simulations, their input data, and how well they worked.

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C.1 CHEMICAL MASS BALANCE

The Chemical Mass Balance (CMB) is used to estimate the contributions from different sources to carbon and $PM_{2.5}$ concentrations in support of NFRAQS objectives 1 and 3. The CMB is also applied in NFRAQS to estimate the contributions to oxides of nitrogen and sulfur dioxide that might have arrived at receptor sites along with primary particles from the included source types. This section explains how the CMB operates, its assumptions, how it was applied to NFRAQS data, tests of deviations from CMB assumptions, and sensitivities to uncertainties and inaccuracies in the input data. Appendices C.1A and C.1B list the individual CMB results with propagated input uncertainties for the extended CMB and conventional CMB analyses, respectively.

C.1.1 CMB Formulation and Software

The Chemical Mass Balance (CMB) is one of several receptor-oriented data analysis methods applicable to air resources management. The CMB uses the chemical and physical characteristics of gases and particles measured at source and receptor to both identify the presence of and to quantify source contributions to receptor concentrations.

Receptor-oriented simulations are generally contrasted with source-oriented atmospheric dispersion simulations that use pollutant emissions rate estimates, meteorological transport, and chemical transformation mechanisms to estimate the contribution of each source to receptor concentrations. The two types of simulation are complementary, with each type having strengths that compensate for the weaknesses of the other. Several review articles, books, and conference proceedings provide additional information about the CMB and other receptor models (Chow, 1985; Chow et al., 1993; Gordon, 1980, 1988; Hopke and Dattner, 1982; Hopke, 1985, 1991; Pace, 1986, 1991; Stevens and Pace, 1984; Watson, 1979; Watson et al., 1984, 1989, 1990, 1991).

The CMB (Friedlander, 1973; Cooper and Watson, 1980; Gordon, 1980, 1988; Watson, 1984; Watson et al., 1984; 1990; 1991; Hidy and Venkataraman, 1996) consists of a solution to linear equations that express each receptor chemical concentration as a linear sum of products of source profile abundances and source contributions. The source profile abundances (i.e., the mass fraction of a chemical or other property in the emissions from each source type) and the receptor concentrations, with appropriate uncertainty estimates, serve as inputs to the CMB. The CMB calculates values for the contributions from each source and the uncertainties of those values.

The CMB is implicit in all factor analysis and multiple linear regression models that intend to quantitatively estimate source contributions (Watson, 1979). These models attempt to derive source profiles from the covariation in space and/or time of many different samples of atmospheric constituents that originate in different sources. These profiles are then used in a CMB to quantify source contributions to each ambient sample.

The CMB is applicable to multi-species data sets, the most common of which are chemically-characterized PM10 (suspended particles with aerodynamic diameters less than 10 µm), $PM_{2.5}$ (suspended particles with aerodynamic diameters less than 2.5 µm), and VOC

(Volatile Organic Compounds). NFRAQS applies the CMB to both stable and semi-volatile components of $PM_{2.5}$ measured along the Northern Front Range.

The CMB procedure requires: 1) identification of the contributing sources types; 2) selection of chemical species or other properties to be included in the calculation; 3) estimation of the fraction of each of the chemical species which is contained in each source type (source profiles); 4) estimation of the uncertainty in both ambient concentrations and source profiles; and 5) solution of the chemical mass balance equations.

Several solutions methods have been proposed for the CMB equations: 1) single unique species to represent each source (tracer solution) (Miller et al.; 2) linear programming solution (Hougland, 1973); 3) ordinary weighted least squares, weighting only by precisions of ambient measurements (Friedlander, 1973; Gartrell and Friedlander,1975; 4) ridge regression weighted least squares (Williamson and DuBose, 1983); 5) partial least squares (Larson and Vong, 1989; Vong et al., 1988); 6) neural networks (Song and Hopke,1996); and 7) effective variance weighted least squares (Watson et al., 1984).

The effective variance weighted solution is almost universally applied because it: 1) theoretically yields the most likely solutions to the CMB equations, providing model assumptions are met; 2) uses all available chemical measurements, not just so-called "tracer" species; 3) analytically estimates the uncertainty of the source contributions based on precisions of both the ambient concentrations and source profiles; and 4) gives greater influence to chemical species with higher precisions in both the source and receptor measurements than to species with lower precisions. The effective variance is a simplification of a more exact, but less practical, generalized least squares solution proposed by Britt and Luecke (1973).

CMB model assumptions are: 1) compositions of source emissions are constant over the period of ambient and source sampling; 2) chemical species do not react with each other (i.e., they add linearly); 3) all sources with a potential for contributing to the receptor have been identified and have had their emissions characterized; 4) the number of sources or source categories is less than or equal to the number of species; 5) the source profiles are linearly independent of each other; and 6) measurement uncertainties are random, uncorrelated, and normally distributed.

The degree to which these assumptions are met in applications depends to a large extent on the particle and gas properties measured at source and receptor. CMB model performance is examined generically, by applying analytical and randomized testing methods, and specifically for each application by following an applications and validation protocol (Pace and Watson, 1987). The six assumptions are fairly restrictive and they will never be totally complied with in actual practice. Fortunately, the CMB model can tolerate reasonable deviations from these assumptions, though these deviations increase the stated uncertainties of the source contribution estimates (Cheng and Hopke, 1989; Currie et al., 1984; deCesar et al., 1985, 1986; Dzubay et al., 1984; Gordon et al., 1981; Henry, 1982, 1992; Javitz and Watson, 1986; Javitz et al., 1988a, 1988b; Kim and Henry, 1989; Lowenthal et al., 1987, 1988a, 1988b, 1988c, 1992, 1994; Watson, 1979).

The CMB is intended to complement rather than replace other data analysis and modeling methods. The CMB explains observations that have already been taken, but it does not predict the future. When source contributions are proportional to emissions, as they often are for PM, VOCs, and the sum of gases and particle phases for certain semi-volatile components, then a source-specific proportional rollback (Barth, 1970; Cass and McCrae, 1981; Chang and Weinstock, 1975; deNevers, 1975) is used to estimate the effects of emissions reductions. Similarly, when a secondary compound apportioned by CMB is known to be limited by a certain precursor, a proportional rollback is used on the controlling precursor.

The most widespread use of CMB over the past decade has been to justify emissions reduction measures in PM_{10} non-attainment areas. More recently, the CMB has been coupled with extinction efficiency receptor models (Lowenthal et al., 1994; Watson and Chow, 1994) to estimate source contributions to light extinction, and with aerosol equilibrium models (Watson et al., 1994) to estimate the effects of ammonia and oxides of nitrogen emissions reductions on secondary nitrates. Section C.2 describes how the limiting precursors for secondary ammonium nitrate source contributions determined by CMB can be determined by equilibrium simulations. Section C.3 describes how the contributors of these precursors can be estimated by transport modeling.

The CMB model does not explicitly treat profiles that change between source and receptor. Most applications use source profiles measured at the source, with at most dilution to ambient temperatures and <1 minute of aging prior to collection to allow for condensation and rapid transformation. Profiles have been "aged" prior to submission to the CMB using aerosol and gas chemistry models to simulate changes between source and receptor (Friedlander, 1981; Lin and Milford, 1994; Venkatraman and Friedlander, 1994, Watson et al., 1996). These models are often overly simplified, and require additional assumptions regarding chemical mechanisms, relative transformation and deposition rates, mixing volumes, and transport times.

The CMB model requires species with different abundances in different source types, and abundances that do not vary by more than approximately ±100% among source types. The consistency of a species abundance is more important than its uniqueness for source quantification. The uniqueness is useful to identify which sources to include in a CMB calculation. Combining particle and gas properties for source emissions, normalized to NMHC (non-methane hydrocarbon) or $PM_{2.5}$ mass emissions, could assist the apportionment of both VOCs and $PM_{2.5}$. CMB software performs tests on ambient data and source profiles that tell how well source-type contributions can be resolved from each other for different combinations of source profiles and chemical measurements.

The CMB quantifies contributions from chemically distinct source-types rather than contributions from individual emitters. Sources with similar chemical and physical properties cannot be distinguished from each other by the CMB. In NFRAQS, a coal-fired power station contribution calculated by the CMB could have come from any combination of the six units identified in Table 2.2-3 of Watson et al. (1998). The potential for specific power station contributions can be narrowed substantially, however, by interpreting the CMB source contributions in conjunction with transport simulations described in Section C.3.

The CMB calculates source contribution estimates for each individual ambient sample. The combination of source profiles that best explains the ambient measurements may differ from one sample to the next owing to differences in emission rates (e.g., some days may have wood-stove burning bans in effect and others will not), wind directions (e.g., a downwind point source would not be expected to be contributing at an upwind sampling site), and changes in emissions compositions (e.g., different gasoline characteristics and engine performance in winter and summer may result in different profiles). It is not known a priori which profile best represents emissions from a source type for a specific sample. The profiles selected for a particular sample are inferred from performance measures that reflect how well the ambient concentrations are reproduced. For this reason, it is important to quantify the magnitude of biases that might result from judgements about profile selection. These biases are quantified as part of the tests reported in this section.

CMB Version 8 is applied to NFRAQS source apportionment. CMB8 (Watson et al., 1997) replaces CMB7 (U.S. EPA, 1989; Watson et al., 1990) as a more convenient method of estimating contributions from different sources to ambient chemical concentrations. CMB8 returns the same results of CMB7, but it operates in a Windows-based environment and accepts inputs and creates outputs in a wider variety of formats than CMB7. The major CMB8 enhancements are:

- Windows-based, menu-driven operations: CMB commands may be executed with hot-keys, drop down menus, or toolbar buttons.

- Multiple defaults for fitting source, fitting species, and sample selection: Up to ten combinations of fitting source profiles and fitting species may be specified in input data selection files. Different defaults can be selected with radio buttons during CMB8 operation. Subsets of source profiles, species, and samples may be specified in selection files to be selected from profile and ambient concentration data files. This is especially useful for executing the test on NFRAQS data reported here.

- Improved memory management: CMB8 memory is limited only by the available RAM on the computer, not by pre-set memory limitations. This was necessary NFRAQS source apportionment owing to the large number of additional species measurements in receptor samples and source profiles.

- Flexible input and output formats: Comma-separate value (CSV), xBASE (DBF), and worksheet (WKS) formats are support as input and output files, in addition to the blank-delimited ASCII text files (TXT) supported by CMB7. NFRAQS analysis made use of this to efficiently produce graphical and tabular summaries of source contribution estimates.

- Improved graphics: Sample pie plots, spatial pie plots, time series stacked bar charts, source profile bar charts, and ambient concentration bar charts can be created within CMB8. These can be cut from their CMB8 windows and pasted into other Windows documents.

- Improved collinearity diagnostics: The uncertainty/similarity clusters have been replaced with an singular value composition eligible space treatment that allows the user to define an acceptable error and an acceptable collinearity among weighted source profiles. This feature was used in NFRAQS to assist the compositing of separate source samples into source profile groups.

- Automatic decision-making: CMB8 calculations can be automated to eliminate negative contributions and to select a default set of profiles based on a weighted optimization of performance measures.

- User-set preferences: Output directories, output file names, positions of decimal points in output, output formats, automatic calculation alternatives, performance measure weights, eligible space tolerances, receptor concentration units, and maximum iterations for convergence can be set by the user.

- Retention from previous sessions: Options and window position preferences established in one session are carried over into subsequent sessions.

C.1.2 CMB Input Data

Source profiles and ambient measurements of stable and semi-volatile gas and particle chemical constituents were used as CMB input data. Both source profiles and ambient concentrations include elemental, ionic, carbon, organic compound, sulfur dioxide, oxides of nitrogen, and carbon monoxide measurements. The NFRAQS core and satellite sites acquired elemental, ionic, and carbon concentrations for the episodic analysis samples, but only the core sites acquired organic compound measurements. Ambient concentration data used as CMB input are the same as those described in Section 6 and source profile data are the same as those of Section 4 in Watson et al. (1998). Chow et al. (1998) describes and evaluates ambient measurements, while Zielinska et al. (1998) describes and evaluates source profile measurements.

Table C.1-1 lists the species, analytical methods and corresponding species mnemonics that are used in the ambient and source composition databases. Table C.1-1 also shows the minimum and maximum ambient concentrations for the 01/12/97 through 01/20/97 episode and the corresponding analytical uncertainties. Species with ratios of concentration to analytical uncertainty less than one were removed from the ambient and source composition databases used in the CMB analyses as they have little influence on the apportionment. Asterisks in Table C.1-1 indicate the species that were retained in the final database.

Table C.1-2a describes the individual and composite source profiles that were developed for the NFRAQS and assigns mnemonic that will be used in subsequent references to these profiles. These are supplemented with profiles from the 1987-88 SCENIC Denver study (Watson et al., 1988) that are described in Table C.1-2b. A coal-fired power station profile from Watson et al. (1988) is used for NFRAQS source apportionment because more recent profiles for this source are unavailable.

Chemical abundances of NFRAQS source profiles are presented in Table C.1-3. The profiles are expressed as weight percentages of total reconstructed PM2.5 mass (i.e., geological [1.89(aluminum + 2.14(silicon + 1.4(calcium + 1.43(iron] + organics [1.2(organic carbon] + elemental carbon + sulfate + nitrate + ammonium + road salt [1.65(chlorine]) with one-sigma analytical errors for individual measurements. The rationales for combining individual profiles into composite profiles are explained in Section 4 of Watson et al. (1998). The uncertainties in the composite profiles are the larger of either the one-sigma variations in fractional abundances among members of the composite or the propagated root mean squares of the analytical uncertainties.

C.1.3 CMB Simulation and Measurement Evaluation

The formalized protocol for CMB model application and validation (Pace and Watson, 1987; Watson et al., 1991; 1998) is applicable to the apportionment of particles and gases (Watson et al., 1994; Fujita et al., 1994). This seven-step protocol: 1) determines model applicability; 2) selects a variety of profiles to represent identified contributors; 3) evaluates model outputs and performance measures; 4) identifies and evaluates deviations from model assumptions; 5) identifies and corrects of model input deficiencies; 6) verifies consistency and stability of source contribution estimates; and 7) evaluates CMB results with respect to other data analysis and source assessment methods. The following sub-sections evaluate the CMB simulation of source contributions by following these steps.

C.1.3.1 Model Applicability

The requirements for CMB model applicability are: 1) a sufficient number of receptor samples is taken with an accepted method to evaluate temporal and spatial variations in hydrocarbon mixing ratios; 2) samples are analyzed for chemical species which are also present in source emissions; 3) potential source contributors have been identified and chemically characterized; and 4) the number of non-collinear source types is less than the number of measured species.

Aerosol samples were taken by well-characterized methods and measurements were fully evaluated (Chow et al., 1998). Major contributors to particulate carbon and PM2.5 along the Northern Front Range are: 1) cold start and high-emitting gasoline-powered vehicle exhaust; 2) normal hot-stabilized gasoline-powered vehicle exhaust; 3) gasoline-powered vehicle emitting visible smoke; 4) diesel exhaust; 5) meat cooking; 6) softwood combustion; 7) hardwood combustion; 8) road dust and sanding; 9) secondary ammonium sulfate; 10) secondary ammonium nitrate; and 11) industrial point sources, including coal-fired power stations, refineries, etc. Representative chemical profiles were acquired from representatives of these sources were tested as part of NFRAQS or from other Colorado air quality studies.

The number of fitting species used in the CMB (about 80-85 species with organic species, about 20-25 species with conventional element, ion, and carbon species) exceeds the number of source types (up to 11 source types). The CMB is applicable to source apportionment of the NFRAQS Winter 97 and Summer 96 data sets.

C.1.3.2 Initial Source Contribution Estimates

Initial CMB tests were performed to select a default combination of source profiles and fitting species for the ambient data. A preliminary set of source profiles consisting of at least one source profile from each source category was applied to NFRAQS Winter 97 organic speciated measurements. These initial apportionments were calculated in batch mode using the CMB8 Autofit option. No attempt was made to manually improve the apportionment. These initial results were used to select subsets of 10-15 samples for two sets of sensitivity tests, one for meat cooking and wood combustion and the other for motor vehicle exhaust. These tests were also used to select a default set of fitting species. Tables C.1-3 and C.1-4 show the results of the sensitivity tests for meat cooking and wood combustion profiles, and motor vehicle profiles, respectively.

Residential Wood Combustion

The range of the carbonaceous fraction explained by alternative individual wood stove profiles (using hardwoods) was 6-10.8% of particulate carbon. The composite profile for this source category (WSHc2) gives an average contribution of 9.3%.

Fireplace combustion profiles (using softwoods) yield contributions of 2.7% carbon for wfpgda and 5.6% for wfend. The composite of these two profiles (WFSc) gives a carbon contribution of 4.4%, which is equal to the variability in the apportionments for individual softwood profiles.

With the exception of wfghd, the individual fireplace/hardwood profiles yield similar apportionments in the range of 0.4-0.7 % carbon. The wfghd apportionment is a statistical outlier, and is excluded from the composite profile (WFHc) for this source category. This composite profile gives an average apportionment of 0.6% carbon, which is similar to all other profiles within the composite. Apple and mesquite are both hardwoods, and their profile yields a carbon apportionment consistent with the majority of the hardwood profiles.

Synthetic log yields the highest apportionment among the wood stove profiles, with an average of 16.7% carbon. This profile is composed of an abundance of elemental carbon, with a lack of other key "marker" compounds. The high elemental carbon content of the synthetic log causes it to be collinear with the diesel profiles, which is why the apportionment for this profile is so high.

Several wood combustion profiles were used together in order to examine the potential for collinearity among subcategories of wood combustion. The softwood composite (WFSc) gives similar apportionments with all alternative hardwood profiles regardless of the type of appliance, wood stove or fireplace. This softwood composite profile is not collinear with any other wood combustion profiles. Using the fireplace/hardwood composite profile with the wood stove/hardwood composite profile results in negative source contributions for the fireplace/hardwood profile. This fireplace/hardwood profile also causes an overall increase in the average predicted apportionment for wood stove. This indicates collinearity between the profiles for hardwood combustion in fireplaces and wood stoves. Because the

contribution to ambient carbon predicted from the fireplace/hardwood profile is negligible (0.5%), the wood stove/hardwood profile was selected as the default hardwood profile.

Meat Cooking

The fractions of ambient fine particles attributed to five alternative meat cooking profiles range from 9.2 to 14.5 percent of total ambient $PM_{2.5}$ carbon with an average of 12.5%. This average is consistent with the apportionment results from the composite of all of these meat profiles (nmc), which was 11.7% (test M01). Running the CMB with the source elimination option on decreased the average overall contribution for both meat cooking and smoking vehicles by 20 and 29%, respectively.

According to the CMB sensitivity matrix, the expected marker species (i.e., lactones and sterols) have the greatest influence on the apportionment of meat cooking. Removing them resulted in a decrease in apportionment for meat cooking and offsetting increase in the prediction for smoking vehicles. Without lactones and sterols, the chemical composition of emissions from meat cooking and smoking vehicles are similar, with high OC content as the distinctive chemical feature. Owing to large uncertainties in quantification of lactones and sterols, the CMB8 effective variance solution reduces their influence on the apportionment relative to more precisely measured components. When lactones are removed as fitting species, the standard error of the source contribution estimate for meat cooking increases. Because each of the alternative meat cooking profiles is collinear with each other, the composite profile, NMc, was selected as the default meat cooking profile.

Motor Vehicles

Sensitivity tests were performed to examine the effect of alternative vehicle emission profiles on the apportionment of a subset of ambient samples using a common set of default profiles for non-vehicular sources. Each of the spark-ignition exhaust profile was used individually with the default set of profiles. All non-smoker phase 2 profiles gave lower carbon contributions than any of the phase 1 profile, regardless of the emitter category. The amounts of particulate carbon apportioned to medium and high emitters are generally much higher in phase 1, but do not correlate with amounts attributed to the corresponding phase 2 profile. In general, the apportionment of heavy-duty diesel and meat cooking do not vary with the use of these alternative spark-ignition exhaust profiles. The relative apportionment between smokers and non-smokers vary with alternative phase 1 non-smoking vehicle exhaust profiles. They also occasionally show collinearity. In subsequent evaluations, we examined the use an incremental cold start profile, which is derived from the difference between phase 1 and phase 3. Compared to the profile for phase 1, incremental cold start is more chemically distinguishable from smoker or hot stabilized emissions. The chemical characteristic of this profile is discussed in Section 4.4.

With the exception of one sample, all of the alternative smoker profiles give about the same apportionment regardless of phase. The differences in apportionment between phase 1 and 2 are within 15 percent and even lower with phase 3. While the relative apportionment among the three spark-ignition profiles (i.e., phase 1, phase 2, and smoker) vary with

alternative profiles for smokers, the amount apportioned to the default meat cooking profile is insensitive to the use of alternative smoker profiles.

The initial CMB tests done for heavy-duty diesel exhaust showed that apportionment of diesel exhaust is relatively insensitive to abundance of EC in the profile. Diesel exhaust with relative abundances of EC of 86 and 63 percent show differences in apportionment of total carbon of 10 percent. In addition to EC, the CMB sensitivity matrix show that particulate PAHs, especially methyl- and dimethyl-phenanthrene, have strong influence on the apportionment.

Sensitivity Tests for Tire Wear and Brake Wear

Because tire wear and brake wear were not tested as part the NFRAQS study, chemical composition profiles were developed for these source from data published by Hildemann et al. (1991) and Rogge et al. (1993). Hildemann et al. (1991) reports elemental data for tire wear and brake wear. Organic data were obtained from Rogge et al (1993). The profiles were derived by converting the emission data into weight fractions normalized to total measured fine particle mass. A nominal uncertainty of 20 percent was applied to the weight fractions. Table C.1-3 shows the average source contribution estimates for tire dust and brake wear for the ten samples that were examined as part of the sensitivity tests of alternative wood combustion profiles. The contributions of both tire wear and brake wear are negligible (<1%). In addition, these profiles are characterized by high standard errors, which indicates that there is a high degree of uncertainty and/or colinearity in these profiles. These profiles were not used in the final NFRAQS apportionment.

Effects of Alternative “Fitting Species” on Source Contribution Estimates

Tests W22-W31 in Table C.1-3 show the effects of using alternative sets of fitting species on the apportionment of two samples from the Welby site. The 12-hour nightime sample taken on 01/18/97 is used in tests W22-W26 and the 6-hour sample taken on the morning of 01/17/97 is used in tests W27-W31. Tests W22 and W28 were both apportioned using default fitting species (inorganic, PAH, methoxy phenols, lactones, sterols, hopanes, and steranes) with R/U values between -2 and +2.

Removing gas-phase PAH from the set of fitting species (tests W23 and W28) has no significant effect on the apportionment. Other potential fitting species have varying effect. Removing methoxy phenols, which are wood smoke markers, results in an increase in apportionment of hardwood combustion in wood stoves from 7.4 to 26.8% and lower apportionment for smoking vehicles and softwood combustion in fireplaces. In contrast, there were no major shifts in apportionment in test W29. Test W29 shows a slight increase in apportionment of wood combustion from 2.1 to 5.6% when methoxy phenols are removed. Although contributions of wood smoke is greater when methoxy phenols are not used as fitting species, the standard error increases significantly.

The effect of removing lactones and cholesterol was investigated in tests W25 and W30. Removing them from the fit decreases the apportionment of meat cooking and increases the contribution of smoking vehicles. The long-chain g-lactones and cholesterol

are considered "marker" species for meat cooking. However, motor vehicles were also found to emit "lactones", which raised questions regarding their proper identification. Since some of the light-duty gasoline and heavy-duty diesel vehicle exhaust samples, when analyzed by electron impact/mass spectrometry (EI/MS), showed an m/z 85 ion (characteristic of lactones) at the same gas chromatographic retention time that correspond to some of the lactones, they were re-analyzed by chemical ionization/mass spectrometry (CI/MS) in order to confirm their identity. None of the light-duty gasoline vehicle exhaust samples contains detectable amounts of lactones. All four lactones were found in heavy-duty diesel exhaust samples, but in much lower amounts than quantified by EI/MS. Six ambient samples (three from the Welby site and three from the Brighton site) were also re-analyzed for lactones using the CI/MS technique. All lactones, previously quantified by EI/MS in the ambient samples, were also identified and quantified by the CI/MS technique. Since all ambient samples were quantified by the EI/MS technique using the m/z 85 ion, some of the compounds emitted by motor vehicles could "artifactually" contribute to the intensity of this ion. Thus, lactones were retained in all motor vehicle profiles, whether or not they were truly lactones. This situation is analogous to the application of "organic" carbon in CMB which contain a variety of unidentified organic compounds. The lactones are also imprecisely quantified, as reflected in measurement precisions that approach or exceed 30% of their concentrations. Owing to these large uncertainties, the CMB8 effective variance solution reduces their influence on the apportionment relative to more precisely measured components. When lactones are removed as fitting species, however, the standard error of source contribution estimates for meat cooking increases.

Tests W26 and W31 in Table C.1-3 were conducted using "conventional" species, which include only total organic carbon, elemental carbon, inorganic ions (nitrate, sulfate, ammonium), and elements. Meat cooking and wood combustion were combined into one composite profile for the conventional CMB. The contribution of wood burning predicted by the conventional CMB was generally larger than for the extended species CMB with greater standard error.

Test M13 examines the effect of excluding organic carbon as a fitting species on the apportionment of meat cooking and smoking vehicles. This caused a large overprediction in mass (128%) with the additional mass distributed between meat cooking and smoking vehicle. Organic carbon is an important species for the apportionment of these profiles. According to the MPN matrix, which estimates the weighted contribution of each species to the fit of each profile, organic carbon is always a significant contributor to the apportionment of these two profiles.

C.1.3.3 Model Outputs and Performance Measures

Pace and Watson (1987) define several performance measures which are examined with each CMB. Table C.1-5 shows a typical CMB8 output report and its associated performance measures. The output contains all information needed to reproduce the source contribution estimates, and these reports are included in the NFRAQS data base for every sample. The upper part of the display shows the source profiles included in each model application. The lower part of the display shows the species that were measured at the

receptor and the species included in the CMB calculation (indicated by a '*' under the column labeled 'I').

Each of the CMB results includes values for the performance measures that are used to evaluate the goodness of the solution, following the regulatory guidance of Pace and Watson (1987). The most useful performance measures are:

- Source Contribution Estimate (SCE): This is the contribution of each source type to the pollutant being apportioned, which is usually the mass concentration. Each of the SCE should be greater than zero and none should exceed the total mass concentration.

- Standard Error (STDERR): This is an indicator of the precision or certainty of each SCE. The STDERR is estimated by propagating the precisions of the receptor data and source profiles through the effective variance least-squares calculations. Its magnitude is a function of the uncertainties in the input data and the amount of collinearity (i.e., degree of similarity) among source profiles. It is desirable to have this value be much less than the source contribution estimate. When the SCE is less than the STDERR, the STDERR is interpreted as an upper limit of the source contribution.

- t-Statistic (TSTAT): This is the ratio of the source contribution estimate to the standard error. A high value for TSTAT (>2.0), shows that the relative precision of the source contribution estimate is high and that the contribution is significant. A low TSTAT value (<2.0) means that a source contribution is not present at a level which exceeds two times the STDERR. Twice the STDERR is a reasonable estimate of the upper limit for a source contribution when TSTAT <2.0.

- R-Square (R SQUARE) and Chi-Square (CHI SQUARE): The R SQUARE measures the variance in the receptor concentrations which is explained by the calculated species concentrations. The CHI SQUARE statistic is the weighted sum of the squares of differences between calculated and measured species concentrations divided by the effective variance and the degrees of freedom (DF). A low R SQUARE (<0.8) indicates that the selected source profiles have not accounted for the variance in the selected receptor concentrations. A large CHI SQUARE (>4.0) means that one or more of the calculated species concentrations differs from the measured concentrations by several uncertainty intervals. The values for these statistics exceed their targets when: 1) contributing sources have been omitted from the CMB calculation; 2) one or more source profiles have been selected which do not represent the contributing source types; 3) precisions of receptor or source profile data are underestimated; and/or 4) source or receptor data are inaccurate.

- Percent of Mass Accounted For (PERCENT MASS): This is the ratio of the sum of the source contributions to the reconstructed mass for particulate samples. The target value is 100%, with a reasonable range of 80% to 120%. Percent mass values which are outside of this range result when: 1) source profiles have been

incorrectly specified; 2) contributing source types have been omitted from the calculation; 3) mass or chemical species measurements are inaccurate; and/or 4) mass measurements are less than 10 $\mu g/m^3$ and within a few precision intervals of the measurements.

- Max. Src. Unc. and Min. Src. Proj. – Replaces U/S CLUSTERS and SUM OF CLUSTER SOURCES: These are used in Henry's (1992) eligible space treatment of collinearity. This treatment uses two parameters, maximum source uncertainty and minimum source projection on the eligible space. These are set to default values of 1.0 and 0.95, respectively, in CMB8. Briefly, the maximum source uncertainty determines the eligible space to be spanned by the eigenvectors whose inverse singular values are less than or equal to the maximum source uncertainty. Estimable sources are defined to be those projection on the eligible space that is at least the minimum source projection. Inestimable sources are sources that are not estimable. To modify these values click in the edit boxes and edit with keyboard entry.

- Ratio of Residual to Its Standard Error (RATIO R/U): This is the ratio of the signed difference between the calculated and measured concentration (the residual) divided by the uncertainty of that residual (square root of the sum of the squares of the uncertainty in the calculated and measured concentrations). The RATIO R/U specifies the number of uncertainty intervals by which the calculated and measured concentrations differ. When the absolute value of the RATIO R/U exceeds 2, the residual is significant. If it is positive, then one or more of the profiles is contributing too much to that species. If it is negative, then there is an insufficient contribution to that species and a source may be missing. The sum of the squared RATIO R/U for fitting species divided by the degrees of freedom yields the CHI-SQUARE. The highest RATIO R/U values for fitting species are the cause of high CHI SQUARE values.

- Ratio of Calculated to Measured Species (RATIO C/M): The column entitled RATIO C/M shows the ratio of calculated to measured concentration and the standard error of that ratio for every chemical species with measured data. The ratios should be near 1.00 if the model has accurately explained the measured concentrations. Ratios which deviate from unity by more than two uncertainty intervals indicate that an incorrect set of profiles is being used to explain the measured concentrations. The RATIO C/M for most species is within the target range for each example.

Nearly 1,000 individual CMB calculations were performed for NFRAQS in various sensitivity tests. Apportionment of the NFRAQS ambient data included 132 apportionments using the "extended" data sets that include specific organic compounds measured at the Welby and Brighton sites of 6-hour or 12-hour durations for the Winter 97 samples. The CMB was also applied to 150 24-hour average "conventional" data sets from all seven NFRAQS Winter 97 sites that included the elemental, ionic, and elemental/organic carbon concentrations that are most commonly measured on source and receptor samples. This

allowed for comparison of source contribution estimates derived from the "extended" and "conventional" CMB calculations for the Welby and Brighton data.

For these source apportionments, R-SQUARE typically exceeded 0.9 and CHI-SQUARE values typically ranged from 0.3 and 0.6. PERCENT MASS values for organic carbon, elemental carbon, total carbon, and $PM_{2.5}$ were within one standard deviation of 100% most of the time.

C.1.3.3 Deviations from Model Assumptions

Assumptions 1 and 2 of the CMB model specify that the compositions of source emissions are constant over the period of ambient and source sampling, and that chemical species do not react with one another. Once released into the atmosphere, primary emissions are subjected to dispersion and transport and, at the same time, to various physical and chemical processes that determine their ultimate environmental fate. Primary emissions from motor vehicles, residential wood combustion, meat cooking, etc., are complex mixtures containing thousands of organic and inorganic constituents in the gas and particulate phases.

These compounds have different chemical reactivities and are removed by dry and wet deposition processes at varying rates. Some of the gaseous species, by a series of chemical transformations, are converted into particles, forming secondary aerosol. Sulfates and nitrates are the most common secondary particles, though a fraction of organic carbon can also result from volatile organic compounds (VOCs) via atmospheric reactions.

While the mechanisms and pathways for inorganic secondary particles are fairly well known, those for secondary organic aerosols are not well understood. Hundreds of precursors are involved in these reactions, and the rates at which these particles form are highly dependent on the concentrations of other pollutants and meteorological variables. Organic compounds present in the gas phase undergo atmospheric transformation through reactions with reactive gaseous species such as OH radicals, NO_3 radicals, or O_3.

Table C.1-6 estimates atmospheric lifetimes for several organic compounds in direct gas-phase emissions due to known tropospheric chemical removal reactions (Atkinson, 1988). These lifetimes (i.e., the time for the compound to decay to 1/e or 37% of its original concentration) are calculated from the corresponding measured reaction rate constants and the average ambient concentration of the tropospheric species involved. Although the individual rate constants are known to a reasonable degree of accuracy (in general, to within a factor of two), the tropospheric concentrations of these key reactive species are much more uncertain.

For example, the ambient concentrations of OH radicals at any given time and/or location are uncertain to a factor of at least five, and more likely ten (Atkinson, 1988). The tropospheric diurnally and annually averaged OH radical concentrations are more certain, to possibly a factor of two. For this reason, the calculated lifetimes listed in Table C.1-6 are approximate only for those reactive species concentrations that are listed in the footnotes. However, these data permit one to estimate the contribution of each of these atmospheric reactions to the overall removal rates of most pollutants from the atmosphere. As can be

seen from Table C.1-7, the major atmospheric loss process for most of the direct emission constituents is by daytime reaction with OH radicals.

For some pollutants, photolysis, reactions with ozone, and reactions with NO_3 radicals during nighttime hours are also important removal routes. For alkanes, the atmospheric lifetimes calculated from the corresponding measured reaction rate constant and the average ambient concentration of OH radicals, ranges from ~19 days for propane (C_3H_8) to ~1 day for n-pentadecane ($C_{15}H_{32}$). For aromatic hydrocarbons, lifetimes range from 18 days for benzene to a few hours for methylnaphthalenes (assuming average 12-hour daylight OH radical concentration of 1 x 106 molecule/cm^3).

Secondary organic compounds in particulate matter include aliphatic acids, aromatic acids, nitro aromatics, carbonyls, esters, phenols, and aliphatic nitrates (Grosjean, 1992; Grosjean and Seinfeld, 1989). However, these compounds can also be present in primary emissions (e.g., Rogge, 1993), thus they are not unique tracers for atmospheric transformation processes.

It has been reported that, in the presence of NO_x, the OH radical reactions with fluoranthene and pyrene present in the gas phase lead to the formation of specific nitroarene isomers different from those present in the direct emissions (Arey et al., 1986, 1989; Atkinson et al., 1990; Zielinska et al., 1990). The nighttime reactions with NO_3 radicals lead to the same product as OH radical reactions which form nitro-fluoranthene and nitro-pyrene isomers (Zielinska et al., 1986). In contrast, the electrophilic nitration reaction of fluoranthene, or pyrene, involving an NO_2^+ ion, produces mainly 3-nitrofluoranthene from fluoranthene and 1-nitropyrene from pyrene and these isomers are present in direct emissions from combustion sources.

In order to assess the importance of atmospheric formation of secondary aerosol, the concentration of 2-nitrofluoranthene and 2-nitropyrene was measured during the NFRAQS at the Welby site (Watson et al., 1998). Although 2-nitrofluoranthene and 2-nitropyrene are present in low amounts in daytime samples collected at the Welby site, their concentrations are not significantly different during sunny and cloudy days. Secondary organic aerosol formation was negligible during the NFRAQS Winter 97 intensive operating period.

With respect to Assumption 3 involving the inclusion of all source types, it appears from the PERCENT MASS performance measures that all of the significant contributors have been included in most of the CMBs.

With respect to Assumption 4 concerning number of species and number of sources, 85 species and up to 11 source profiles were used in each calculation. The number of chemical species always exceeded the number of source types.

With respect to Assumption 5 concerning collinearity, this was largely eliminated by the inclusion of specific organic species in the extended data sets. These were sufficient to separate contributions from fireplaces, wood stoves, meat cooking, diesel exhaust, gasoline smoker exhaust, gasoline cold-start exhaust, and gasoline hot-stabilized exhaust. For the conventional data sets, woodburning and meat cooking were collinear and the gasoline

exhaust contributors were collinear. Source-types for suspended dust, secondary ammonium sulfate and ammonium nitrate, and specific coal-fired power station contributions could not be resolved. Profiles for other industrial point sources were lacking, and their primary particle contributions could not be explicitly estimated by the CMB.

The effects of deviations from Assumption 6 on the randomness and normality of measurement errors remain to be studied. For this study, all of the CMB assumptions are met to the extent that the source contribution estimates can be considered valid.

C.1.3.4 Identification and Correction of Model Input Errors

Many Level 3 validation deficiencies in the processing, formatting, compositing, and reporting of ambient concentration and source profile measurements were identified and corrected or flagged as a result of CMB8 source apportionment. Corrections and flags have been incorporated into the NFRAQS data base, and the results presented by Watson et al. (1998) reflect these changes. Some chemical species concentrations were physically unreasonable, as indicated by large CHI-SQUARE values with a large R/U value for the related species. The trimethylnaphthalenes and biphenyls consistently showed large R/U values. The reason is not readily apparent. In these cases the suspect species was removed from the fit. In general, the CMB modeling was robust enough that, when performance measures were within acceptable ranges around target values, there was little effect of suspect concentrations on the source contribution estimates.

C.1.3.5 Consistency and Stability of Source Contributions

The source contribution estimates and the statistics and diagnostic information were reviewed to determine the validity of the initial model results. The analysis was repeated by eliminating source profiles that gave negative source contribution estimates or standard errors that exceed the source contribution estimates. The good agreement between the calculated source contributions and the measured ambient concentrations indicate that all major source types were included in the calculations, that ambient and source profile measurements are reasonably accurate, and that the source profiles are reasonably representative of actual emissions.

C.1.3.6 Consistency with Other Simulations and Data Analyses

Watson et al. (1998) demonstrate that the CMB8 source contribution estimates for carbon and $PM_{2.5}$ are consistent with other NFRAQS data analysis and simulations.

Table C.1-1
NFRAQS Chemical Mass Balance (CMB) Modeling Species Selections

Species	Method	Mnemonic	CMB Input	MAX C/U	Jan12-20 Concentration (ug/m3) max	max_unc	min	min_unc
Mass	Grav	MSGC	*	19.57	52.846100	2.700800	3.315200	0.381500
chloride	IC	CLIC	*	10.31	0.567300	0.055000	0.008600	0.018900
nitrate	IC	N3IC	*	15.18	14.067100	0.926845	0.192100	0.056003
sulfate	IC	S4IC	*	12.60	5.036600	0.399700	0.196300	0.027900
ammonium	AC	N4CC	*	18.85	5.044600	0.267600	0.153800	0.024600
soluble potassium	AA	KPAC	*	13.56	0.073200	0.005400	0.010900	0.002000
total carbon	TOR	TCTC	*					
organic carbon	TOR	OCTC	*	11.68	13.155008	1.126233	0.032277	-0.000789
elemental carbon	TOR	ECTC	*	10.49	8.127000	0.774600	0.131600	0.112400
Sodium	XRF	NAXC	*	1.74	0.169000	0.097000	0.000000	0.014500
Magnesium	XRF	MGXC	*	1.25	0.057900	0.046400	0.000000	0.007400
Aluminum	XRF	ALXC	*	10.34	0.145800	0.014100	0.000000	0.003900
Silicon	XRF	SIXC	*	18.38	0.556800	0.030300	0.025500	0.004400
Phosphorus	XRF	PHXC	*	0.36	0.006400	0.017600	0.000000	0.002000
Sulfur	XRF	SUXC	*	19.91	2.369700	0.119000	0.096000	0.006100
Chlorine	XRF	CLXC	*	15.67	0.434100	0.027700	0.000000	0.002900
Potassium	XRF	KPXC	*	17.63	0.153400	0.008700	0.012300	0.002700
Calcium	XRF	CAXC	*	17.39	0.246900	0.014200	0.005700	0.003000
Titanium	XRF	TIXC	*	0.76	0.025500	0.033400	0.000000	0.014100
Vanadium	XRF	VAXC	*	0.10	0.001700	0.017700	0.000000	0.006400
Chromium	XRF	CRXC	*	0.72	0.003900	0.005400	0.000000	0.001700
Manganese	XRF	MNXC	*	5.46	0.014200	0.002600	0.000000	0.000900
Iron	XRF	FEXC	*	19.54	0.371200	0.019000	0.009700	0.002000
Cobalt	XRF	COXC		0.13	0.000800	0.006100	0.000000	0.000800
Nickel	XRF	NIXC	*	2.76	0.004700	0.001700	0.000000	0.000600
Copper	XRF	CUXC	*	10.44	0.016700	0.001600	0.000200	0.000500
Zinc	XRF	ZNXC	*	19.04	0.099000	0.005200	0.003500	0.000700
Gallium	XRF	GAXC		0.48	0.001300	0.002700	0.000000	0.001000
Arsenic	XRF	ASXC	*	0.62	0.002600	0.004200	0.000000	0.001000
Selenium	XRF	SEXC	*	0.76	0.001300	0.001700	0.000000	0.000500
Bromine	XRF	BRXC	*	4.60	0.006900	0.001500	0.000500	0.000500
Rubidium	XRF	RBXC	*	0.27	0.000400	0.001500	0.000000	0.000500
Strontium	XRF	SRXC	*	1.44	0.002300	0.001600	0.000000	0.000500
Yttrium	XRF	YTXC		0.45	0.000900	0.002000	0.000000	0.000700
Zirconium	XRF	ZRXC	*	0.48	0.001100	0.002300	0.000000	0.000800
Molybdenum	XRF	MOXC		0.55	0.002300	0.004200	0.000000	0.001500
Palladium	XRF	PDXC		0.42	0.004800	0.011300	0.000000	0.004400
Silver	XRF	AGXC		0.49	0.006500	0.013400	0.000000	0.004500
Cadmium	XRF	CDXC		0.55	0.007900	0.014300	0.000000	0.005700
Induium	XRF	INXC		0.41	0.006900	0.016900	0.000000	0.005600
Tin	XRF	SNXC		0.47	0.010200	0.021500	0.000000	0.008600
Antimony	XRF	SBXC		0.67	0.016800	0.025000	0.000000	0.010000
Barium	XRF	BAXC		0.55	0.050000	0.091600	0.000000	0.028700
Lanthanum	XRF	LAXC		0.38	0.046600	0.122700	0.000000	0.049200
Gold	XRF	AUXC		0.41	0.002200	0.005400	0.000000	0.002000
Mercury	XRF	HGXC	*	0.43	0.001600	0.003700	0.000000	0.001400
Thallium	XRF	TLXC		0.39	0.001400	0.003600	0.000000	0.001300
Lead	XRF	PBXC	*	3.76	0.016900	0.004500	0.000000	0.001400
Uranium	XRF	URXC		0.25	0.000900	0.003600	0.000000	0.001300
Naphthalene	GC/MS	NAPHTH	*	18.09	1.156852	0.063967	0.000000	0.000742
2-menaphthalene	GC/MS	MNAPH2	*	17.47	1.286098	0.073619	0.000000	0.000800
1-menaphthalene	GC/MS	MNAPH1	*	16.47	0.828161	0.050279	0.000000	0.000438
2,6+2,7-dimenaphthalene	GC/MS	DMN267	*	13.71	0.133432	0.009735	0.000256	0.001065
1,7+1,3+1,6-dimenaphthalene	GC/MS	DM1367	*	14.79	0.316667	0.021418	0.000000	0.001409
2,3+1,4+1,5-dimenaphthalene	GC/MS	D14523	*	11.14	0.068340	0.006132	0.000013	0.001674
1,2-dimenaphthalene	GC/MS	DMN12	*	8.63	0.026757	0.003101	0.000269	0.001009
1,8-dimenapthalene	GC/MS	DMN18		0.17	0.002314	0.013383	0.000000	0.000850
Biphenyl	GC/MS	BIPHEN	*	17.17	0.084879	0.004944	0.000000	0.000247
2-Methylbiphenyl	GC/MS	M_2BPH	*	13.46	0.019728	0.001466	0.000255	0.000190
3-Methylbiphenyl	GC/MS	M_3BPH	*	17.96	0.079533	0.004428	0.001440	0.000203
4-Methylbiphenyl	GC/MS	M_4BPH	*	15.41	0.042321	0.002746	0.001077	0.000198
A-Trimethylnaphthalene	GC/MS	ATMNAP	*	14.74	0.065446	0.004440	0.000875	0.000195
1-Ethyl-2-methylnaphthalene	GC/MS	EM_12N	*	10.57	0.020260	0.001917	0.000229	0.000191
B-Trimethylnaphthalene	GC/MS	BTMNAP	*	13.46	0.066775	0.004962	0.000992	0.000221
C-Trimethylnaphthalene	GC/MS	CTMNAP	*	15.12	0.073184	0.004839	0.001195	0.000200
2-Ethyl-1-methylnaphthalene	GC/MS	EM_21N	*	5.62	0.003134	0.000558	0.000040	0.000155
E-Trimethylnaphthalene	GC/MS	ETMNAP	*	12.94	0.048848	0.003775	0.000767	0.000194
F-Trimethylnaphthalene	GC/MS	FTMNAP	*	9.44	0.026373	0.002794	0.000474	0.000192
G-Trimethylnaphthalene	GC/MS	GTMNAP	*	5.61	0.005611	0.001001	0.000090	0.000170

Table C.1-1 (continued)
NFRAQS Chemical Mass Balance (CMB) Modeling Species Selections

Species	Method	Mnemonic	CMB Input	MAX C/U	Jan12-20 Concentration (ug/m3) max	max_unc	min	min_unc
H-Trimethylnaphthalene	GC/MS	HTMNAP	*	2.92	0.002835	0.000971	0.000012	0.000155
1,2,8-Trimethylnaphthalene	GC/MS	TM128N	*	11.81	0.041235	0.003492	0.000000	0.001017
Acenaphthylene	GC/MS	ACNAPY	*	15.45	0.062674	0.004056	0.000074	0.000451
Acenaphthene	GC/MS	ACNAPE	*	16.12	0.074925	0.004648	0.000000	0.000133
Phenanthrene	GC/MS	PHENAN	*	12.14	0.060832	0.005010	0.000000	0.000286
Fluorene	GC/MS	FLUORE	*	10.82	0.015564	0.001439	0.000483	0.000191
A-Methylfluorene	GC/MS	A_MFLU	*	7.52	0.007097	0.000944	0.000268	0.000190
1-Methylfluorene	GC/MS	M_1FLU	*	6.15	0.003514	0.000571	0.000112	0.000155
B-Methylfluorene	GC/MS	B_MFLU	*	11.25	0.014163	0.001259	0.000512	0.000192
C-Methylfluorene	GC/MS	C_MFLU	*	10.85	0.011241	0.001036	0.000310	0.000157
A-Methylphenanthrene	GC/MS	A_MPHT	*	11.06	0.011636	0.001052	0.000390	0.000174
2-Methylphenanthrene	GC/MS	M_2PHT	*	4.07	0.003616	0.000888	0.000023	0.000155
B-Methylphenanthrene	GC/MS	B_MPHT	*	10.25	0.007974	0.000778	0.000271	0.000156
C-Methylphenanthrene	GC/MS	C_MPHT	*	8.78	0.006940	0.000790	0.000215	0.000156
1-Methylphenanthrene	GC/MS	M_1PHT	*	4.19	0.002688	0.000641	0.000068	0.000155
3,6-Dimethylphenanthrene	GC/MS	DM36PH	*	4.72	0.003249	0.000688	0.000068	0.000155
A-Dimethylphenanthrene	GC/MS	A_DMPH	*	4.19	0.002038	0.000486	0.000068	0.000155
B-Dimethylphenanthrene	GC/MS	B_DMPH	*	9.71	0.006497	0.000669	0.000135	0.000155
C-Dimethylphenanthrene	GC/MS	C_DMPH	*	4.50	0.003018	0.000670	0.000045	0.000155
1,7-Dimethylphenanthrene	GC/MS	DM17PH	*	4.59	0.002363	0.000515	0.000000	0.000155
D-Dimethylphenanthrene	GC/MS	D_DMPH	*	3.48	0.002215	0.000636	0.000045	0.000155
E-Dimethylphenanthrene	GC/MS	E_DMPH	*	4.55	0.011621	0.002554	0.000000	0.000133
Anthracene	GC/MS	ANTHRA	*	2.58	0.001750	0.000677	0.000011	0.000155
9-Methylanthracene	GC/MS	M_9ANT		13.57	0.013695	0.001009	0.000000	0.000302
Fluoranthene	GC/MS	FLUORA	*	14.14	0.011977	0.000847	0.000000	0.000208
Pyrene	GC/MS	PYRENE	*					
A-Methylpyrene	GC/MS	A_MPYR		1.10	0.000498	0.000453	0.000027	0.000155
B-Methylpyrene	GC/MS	B_MPYR	*	2.75	0.001247	0.000454	0.000024	0.000155
C-Methylpyrene	GC/MS	C_MPYR		1.21	0.000547	0.000453	0.000013	0.000155
D-Methylpyrene	GC/MS	D_MPYR	*	1.70	0.000768	0.000453	0.000031	0.000155
E-Methylpyrene	GC/MS	E_MPYR		1.55	0.000701	0.000453	0.000025	0.000155
F-Methylpyrene	GC/MS	F_MPYR	*	2.35	0.001071	0.000455	0.000040	0.000155
Retene	GC/MS	RETENE	*	1.30	0.000825	0.000635	0.000000	0.000217
Benzonaphthothiophene	GC/MS	BNTIOP		0.34	0.000309	0.000907	0.000000	0.000309
Benz(a)anthracene	GC/MS	BAANTH	*	2.11	0.002916	0.001383	0.000160	0.000449
7-Methylbenz[a]anthracene	GC/MS	M_7BAA		0.47	0.000214	0.000453	0.000000	0.000155
Chrysene	GC/MS	CHRYSN	*	2.61	0.001772	0.000680	0.000000	0.000249
Benzo(b+j+k)FL	GC/MS	BBJKFL	*	3.55	0.002689	0.000757	0.000000	0.000264
BeP	GC/MS	BEPYRN	*	2.65	0.001565	0.000590	0.000000	0.000169
BaP	GC/MS	BAPYRN	*	0.93	0.001354	0.001451	0.000013	0.000495
7-Methylbenzo[a]pyrene	GC/MS	M_7BPY		0.35	0.000160	0.000453	0.000000	0.000155
Indeno[123-cd]Pyrene	GC/MS	INCDPY	*	0.94	0.001152	0.001224	0.000000	0.000418
Dibenz(ah+ac)anthracene	GC/MS	DBANTH	*	0.15	0.000266	0.001768	0.000000	0.000603
Benzo(b)chrysene	GC/MS	BBCHRN		0.12	0.000107	0.000907	0.000000	0.000309
Benzo(ghi)Perylene	GC/MS	BGHIPE	*	1.68	0.002664	0.001586	0.000000	0.000541
Coronene	GC/MS	CORONE	*	0.51	0.001624	0.003173	0.000038	0.001082
A-Caprolactone	GC/MS	GCAPLA		4.44	0.033824	0.007623	0.000120	0.000155
Guaiacol	GC/MS	GUACOL	*	2.39	0.159306	0.066553	0.000000	0.000322
4-Methylguaiacol	GC/MS	M4GUCL	*	5.15	0.020281	0.003935	0.000000	0.000190
4-Ethylguaiacol	GC/MS	E4GUCL	*	5.57	0.017799	0.003197	0.000000	0.000171
Syringol	GC/MS	SYRGOL	*	1.49	0.005421	0.003632	0.000000	0.000170
Propylguaiacol	GC/MS	PPGUCL	*	3.53	0.007120	0.002016	0.000000	0.000155
4-Allylguaiacol	GC/MS	A4GUCL	*	6.15	0.007164	0.001164	0.000000	0.000170
G-Nonanoic Lactone	GC/MS	GNONLA	*	17.94	0.022642	0.001262	0.000000	0.000155
4-formylguaiacol	GC/MS	F4GUCL	*	2.77	0.047223	0.017043	0.000000	0.000190
4-Methylsyringol	GC/MS	M4SYRG	*	2.23	0.005523	0.002480	0.000000	0.000190
4-Ethylsyringol	GC/MS	E4SYRG	*	6.57	0.025546	0.003890	0.000000	0.000266
Isoeugenol	GC/MS	ISOEUG	*	16.24	0.114727	0.007064	0.000000	0.000193
G-Decanolactone	GC/MS	GDECLA	*	4.80	0.012952	0.002700	0.000000	0.000208
Acetovanillone	GC/MS	ACETVA	*	2.66	0.009867	0.003710	0.000000	0.000263
Undecanoic-G-Lactone	GC/MS	UNGLAC	*	4.26	0.004610	0.001082	0.000000	0.000155
Syringaldehyde	GC/MS	SYRALD	*	8.91	0.156761	0.017597	0.000000	0.000247
ERGOSTANE	GC/MS	ERGOS		0.21	0.000113	0.000538	0.000000	0.000160
SITOSTANE	GC/MS	SITOS		0.00	0.000000	0.000479	0.000000	0.000155
diasterane-1 (C27 20S-13B,17@-diasterane)	GC/MS	C27SDS	*	4.70	0.005790	0.001233	0.000000	0.000155
diasterane-2 (C27 20R-13B,17B-diasterane)	GC/MS	C27RDS	*	1.73	0.000797	0.000461	0.000000	0.000155
cholestane-1 (C27 20R-5@,14B,17B-cholestane)	GC/MS	C27RCH		0.00	0.000000	0.000685	0.000000	0.000155
cholestane-2 (C27 20S-5@,14B,17B-cholestane)	GC/MS	C27SBC		0.00	0.000000	0.000523	0.000000	0.000155
cholestane-3 (C27 20R-5@,14@,17@-cholestane)	GC/MS	C27RAC	*	0.89	0.000847	0.000955	0.000000	0.000160

Table C.1-1 (continued)
NFRAQS Chemical Mass Balance (CMB) Modeling Species Selections

Species	Method	Mnemonic	CMB Input	MAX C/U	Jan12-20 Concentration (ug/m3) max	max_unc	min	min_unc
trisnorhopane-1 (17@(H),18@(H),21B(H)-25,28,30-Trisnorhopane)	GC/MS	AABTNH		0.68	0.000469	0.000685	0.000000	0.000155
trisnorhopane-2 (17@(H),21B(H),22,29,30-Trisnorhopane)	GC/MS	AB_TNH		1.03	0.000493	0.000480	0.000012	0.000155
norhopane-1 (17@(H),21B(H)-30 -Norhopane)	GC/MS	AB30NH	*	1.06	0.001480	0.001398	0.000000	0.000160
Cholesterol	GC/MS	CHLSRL	*	0.00	0.000000	0.010826	0.000000	0.000215
norhopane-2 (17B(H),21@(H)-30-Norhopane)	GC/MS	BA30NH	*	1.09	0.000916	0.000837	0.000011	0.000155
hopane-1 (17@(H),21B(H)-Hopane)	GC/MS	AB_HOP	*	3.20	0.001890	0.000590	0.000000	0.000155
Steroid-w	GC/MS	STEROW		1.29	0.009041	0.007021	0.000000	0.000169
hopane-2 (17B(H),21@(H)-Hopane)	GC/MS	BA_HOP	*	1.51	0.000727	0.000481	0.000011	0.000155
homohopane-1 (22S-17@(H),21B(H)-30-Homohopane)	GC/MS	SABHHP	*	1.30	0.001238	0.000954	0.000012	0.000155
homohopane-2 (22R-17@(H),21B(H)-30-Homohopane)	GC/MS	RABHHP	*	2.79	0.001265	0.000454	0.000012	0.000155
Sitosterol	GC/MS	SITOST		0.51	0.182262	0.358517	0.000000	0.000233
hopane-3 (17B(H),21B(H)-Hopane)	GC/MS	BB_HOP		0.78	0.000517	0.000662	0.000011	0.000155
Steroid-m	GC/MS	STEROM	*	1.70	0.707532	0.416713	0.000000	0.000219
bishomohopane-1 (22S-17@(H),21B(H)-30,31-Bishomohopane)	GC/MS	SABBHH	*	0.94	0.001550	0.001646	0.000012	0.000155
bishomohopane-2 (22R-17@(H),21B(H)-30,31-Bishomohopane)	GC/MS	RABBHH	*	2.78	0.001260	0.000453	0.000011	0.000155

Table C.1-2a
NFRAQS Source Composition Profiles

PNO	Mnemonic	Size	Type	Description
N001	NWNSP	F	Composite	Winter, non-smoker, Phase 1 minus Phase 2, L2, ML1, M1,M2,M3,H1
N002	NWLP	F	Composite	Winter, non-smoker, Phase1 - Phase 2, L2, ML1, ML2
N003	NWHP	F	Composite	Winter, non-smoker, Phase1 - Phase 2, M1,M3,H1
N004	NWNSP1	F	Composite	Winter, non-smoker, Phase 1 - L2P1, ML1P1, M1P1,M2P1,M3P1,H1P1
N005	NWNSP1mC	F	Composite	Winter, non-smoker, Phase 1 - L2P1, ML1P1, M1P1,M2P1,M3P1,H1P1 minus backup carbon
N006	NWNSP1pC	F	Composite	Winter, non-smoker, Phase 1 - L2P1, ML1P1, M1P1,M2P1,M3P1,H1P1 plus backup carbon
N007	NWNSP2	F	Composite	Winter, non-smoker, Phase 2 - L1P2,L2P2, ML1P2, M1P2,M2P2,M3P2,H1P2,H2P2
N008	NWNSP2mC	F	Composite	Winter, non-smoker, Phase 2 - L1P2,L2P2, ML1P2, M1P2,M2P2,M3P2,H1P2,H2P2 minus backup carbon
N009	NWNSP2pC	F	Composite	Winter, non-smoker, Phase 2 - L1P1,L2P2, ML1P2, M1P2,M2P2,M3P2,H1P2,H2P2 plus backup carbon
N010	NWSM	F	Composite	Winter, smokers, S2P1,S2P2,S2P3,S3P1,S3P2,S3P3
N011	NWSMmC	F	Composite	Winter, smokers, S2P1,S2P2,S2P3,S3P1,S3P2,S3P3 minus backup carbon
N012	NWSMpC	F	Composite	Winter, smokers, S2P1,S2P2,S2P3,S3P1,S3P2,S3P3 plus backup carbon
N013	NWHD	F	Composite	Winter, heavy-duty diesel, runs 2-15
N014	NWHDmC	F	Composite	Winter, heavy-duty diesel, runs 2-15 minus backup carbon
N015	NWHDpC	F	Composite	Winter, heavy-duty diesel, runs 2-15 plus backup carbon
N016	NWLCP1	F	Composite	Winter, low emitter, phase 1 - L2P1, ML1P1, M2P1
N017	NWLCP2	F	Composite	Winter, low emitter, phase 2 - L2P2, ML1P2, M2P2
N018	NWLCP3	F	Composite	Winter, low emitter, phase 3 - L2P3, ML1P3, M2P3
N019	NWLCPC	F	Composite	Winter, low emitter, FTP composite - L2PC, ML1PC, M2PC
N020	NWL2P1	F	Individual	Winter, low emitter, phase 1 - L2P1
N021	NWL2P2	F	Individual	Winter, low emitter, phase 2 - L2P2
N022	NWL2P3	F	Individual	Winter, low emitter, phase 3 - L2P3
N023	NWL2C	F	Individual	Winter, low emitter, FTP composite - L2PC
N024	NWHCP1	F	Composite	Winter, high emitter, phase1 - M1P1, M3P1, H1P1
N025	NWHCP2	F	Composite	Winter, high emitter, phase 2 - M1P2, M3P2, H1P2
N026	NWHCP3	F	Composite	Winter, high emitter, phase 3 - M1P3, M3P3, H1P3
N027	NWHCPC	F	Composite	Winter, high emitter, FTP composite - M1PC, M3PC, H1PC
N028	NWH1P1	F	Individual	Winter, high emitter, phase 1, H1P1
N029	NWH1P2	F	Individual	Winter, high emitter, phase 2, H1P2
N030	NWH1P3	F	Individual	Winter, high emitter, phase 3, H1P3
N031	NWH1C	F	Individual	Winter, high emitter, FTP composite, H1PC
N032	NWnSP1	F	Composite	Winter, non-smoker, phase 1, L2P1, ML1P1, ML2P1, M2P1, M1P1, M3P1, H1P1
N033	NWnSP2	F	Composite	Winter, non-smoker, phase 2, L2P2, ML1P2, ML2P2, M2P2, M1P2, M3P2, H1P2
N034	NWnSP3	F	Composite	Winter, non-smoker, phase 3, L2P3, ML1P3, ML2P3, M2P3, M1P3, M3P3, H1P3
N035	NWnSPC	F	Composite	Winter, non-smoker, FTP composite, L2PC, ML1PC, ML2PC, M2PC, M1PC, M3PC, H1PC
N036	NWSCP1	F	Composite	Winter, smoker, phase 1, S1P1, S2P1, S3P1
N037	NWSCP2	F	Composite	Winter, smoker, phase 2, S1P2, S2P2, S3P2
N038	NWSCP3	F	Composite	Winter, smoker, phase 3, S1P3, S2P3, S3P3
N039	NWSCPC	F	Composite	Winter, smoker, FTP composite, S1PC, S2PC, S3PC
N040	NWSaP1	F	Composite	Winter, smoker, phase 1, S2P1, S3P1
N041	NWSaP2	F	Composite	Winter, smoker, phase 2, S2P2, S3P2
N042	NWSaP3	F	Composite	Winter, smoker, phase 3, S2P3, S3P3
N043	NWSaPC	F	Composite	Winter, smoker, FTP composite, S2PC, S3PC
N044	NWLDCP1	F	Composite	Winter, light-duty diesel, phase 1, LD1P1, LD2P1, LD3P1, LD4P1, LD5P1
N045	NWLDCP2	F	Composite	Winter, light-duty diesel, phase 2, LD1P2, LD2P2, LD3P2, LD4P2, LD5P2
N046	NWLDCP3	F	Composite	Winter, light-duty diesel, phase 3, LD1P3, LD2P3, LD3P3, LD4P3, LD5P3
N047	NWLDCPC	F	Composite	Winter, light-duty diesel, FTP composite, LD1PC, LD2PC, LD3PC, LD4PC, LD5PC
N048	NWHDc	F	Composite	Winter, heavy-duty diesel, runs 2-15 (all)
N049	NWHDOc	F	Composite	Winter, heavy-duty diesel, runs 2,5,8,10,16,17,24,32 (others)
N050	NMc	F	Composite	Composite of NMAHa, NMCH, NMCCa, and NMCK
N051	NMAHa	F	Average	3 replicate samples, automated charbroiler, hamburger, samples MAH1, 2, and 3
N052	NMCH	F	Individual	Charbroiled hamburger, sample MCH1
N053	NMCCa	F	Average	Charbroiled chicken w/skin, samples MCC1 and MCC2
N054	NMCK	F	Individual	Charbroiled steak, sample MCK1

Table C.1-2a (continued)
NFRAQS Source Composition Profiles

N055	NWFSc	F	Composite	Fireplace burning soft woods
N056	NWFGPDa	F	Average	Fireplace, Pine, samples WFGPD1, 2 and 3 with Grate, Dry
N057	NWFEND	F	Individual	Fireplace, piñon, sample WFEND1, Empty, Dry
N058	NWFGAMD	F	Individual	Fireplace, Apple/Mesquite, sample WFGAMD1, with Grate, Dry
N059	NWFGBD	F	Individual	Fireplace, Bundled wood, sample WFGBD1, with Grate, Dry
N060	NWFHc	F	Composite	Fireplace burning hard woods
N061	NWFEHD	F	Individual	Fireplace, mixed Hardwood, sample WFEHD1, Empty, Dry
N062	NWFGHD	F	Individual	Fireplace, mixed Hardwood, sample WFGHD2, with Grate, Dry
N063	NWFGOD	F	Individual	Fireplace, Oak, sample WFGOD1, with Grate, Dry
N064	NWFGOW	F	Individual	Fireplace, Oak, sample WFGOW1, with Grate, Wet
N065	NWFGDD	F	Individual	Fireplace, Duraflame, sample WFGDD1, with Grate, Dry
N066	NWSHc	F	Composite	Woodstove burning hardwood
N067	NWSHDHH	F	Individual	Woodstove, mixed hardwood, sample WSHDHH1, Dry, High fuel, High burn
N068	NWSHDHL	F	Individual	Woodstove, mixed hardwood, sample WSHDHL1, Dry, High fuel, Low burn
N069	NWSHDLH	F	Individual	Woodstove, mixed hardwood, sample WSHDLH1, Dry, Low fuel, High burn
N070	NWSHDLL	F	Individual	Woodstove, mixed hardwood, sample WSHDLL1, Dry, Low fuel, Low burn
N071	NWSODHLa	F	Individual	Woodstove, Oak, sample WSODHL1, Dry, High fuel, Low burn
N072	NWSOWHL	F	Individual	Woodstove, Oak, WSOWHL2, Wet, High fuel, Low burn
N073	NRDC	F	Composite	Composite roaddust, NRD01 to 05
N074	NRD01	F	Individual	Jewell, w of Kendall on 10/25/96, sample 717
N075	NRD02	F	Individual	Kipling at Federal on 3/3/97, sample 818
N076	NRD03	F	Individual	Kipling at Federal on 3/2/97, sample 819
N077	NRD04	F	Individual	Speer, Bannock to 11th on 12/21/96, sample 831
N078	NRD05	F	Individual	Jewell, w of Kendall on 12/24/96, sample 800
N079	AMSUL	F	Calculated	Secondary ammonium sulfate
N080	AMBSUL	F	Calculated	Secondary ammonium bisulfate
N081	AMNIT	F	Calculated	Secondary ammonium nitrate
N135	NSLCP1	F	Composite	Summer, Light-Duty, GasoSummer, LineL2P1
N136	NSLCP2	F	Composite	Summer, Light-Duty, GasoSummer, LineL2P2
N137	NSLCP3	F	Composite	Summer, Light-Duty, GasoSummer, LineL2P3
N138	NSLCPC	F	Composite	Summer, Light-Duty, GasoSummer, LineL2PC
N139	NSMCP1	F	Composite	Summer, Light-Duty, GasoSummer, LineM1P1
N140	NSMCP2	F	Composite	Summer, Light-Duty, GasoSummer, LineM1P2
N141	NSMCP3	F	Composite	Summer, Light-Duty, GasoSummer, LineM1P3
N142	NSMCPC	F	Composite	Summer, Light-Duty, GasoSummer, LineM1PC
N143	NSHCP1	F	Composite	Summer, Light-Duty, GasoSummer, LineH1P1
N144	NSHCP2	F	Composite	Summer, Light-Duty, GasoSummer, LineH1P2
N145	NSHCP3	F	Composite	Summer, Light-Duty, GasoSummer, LineH1P3
N146	NSHCPC	F	Composite	Summer, Light-Duty, GasoSummer, LineH1PC
N147	NSSCP1	F	Composite	Summer, Light-Duty, GasoSummer, LineS1P1
N148	NSSCP2	F	Composite	Summer, Light-Duty, GasoSummer, LineS1P2
N149	NSSCP3	F	Composite	Summer, Light-Duty, GasoSummer, LineS1P3
N150	NSSCPC	F	Composite	Summer, Light-Duty, GasoSummer, LineS1PC
N151	NSLDCP1	F	Composite	Summer, Light-Duty, DieselLD1P1
N152	NSLDCP2	F	Composite	Summer, Light-Duty, DieselLD1P2
N153	NSLDCP3	F	Composite	Summer, Light-Duty, DieselLD1P3
N154	NSLDCPC	F	Composite	Summer, Light-Duty, DieselLD1PC

Table C.1-2b
Source Composition Profiles from the 1987 Scenic Denver Study and Other Studies

PNO	Mnemonic	Size	Type	Description
N082	BRAKE	B	Individual	radial tire (195/60R-15 Toyo, 7200 miles
N083	TRDST	B	Individual	
N084	GPHWYC1	F	Composite	3 samples. Interstate highway.
N085	GCYSTC3	F	Composite	2 samples. City street near civic center.
N086	GSCRDC4	F	Composite	2 samples. Secondary paved roads.
N087	GRSDMC5	F	Composite	2 samples. Road sanding material.
N088	GHWYTC6	F	Composite	2 samples. Stapleton Tunnel.
N089	GHWSTC7	F	Composite	3 samples. Stapleton Tunnel and adjacent dirt.
N090	GPRDVC8	F	Composite	6 samples. Paved roads (general).
N091	GUADVC9	F	Composite	5 samples. Unpaved roads (general).
N092	GAGSLC2	F	Composite	2 samples. Agricultural soil.
N093	MNDCC	F	Composite	9 samples. Dynamometer diesel, cold start.
N094	MNDCS	F	Composite	9 samples. Dynamometer diesel, cold stabilized.
N095	MNDCH	F	Composite	9 samples. Dynamometer diesel, hot transient.
N096	MLCC	F	Composite	10 samples. Dynamometer leaded, cold start.
N097	MLCS	F	Composite	10 samples. Dynamometer leaded, cold stabilized.
N098	MLCH	F	Composite	9 samples. Dynamometer leaded, hot transient.
N099	MUCCC	F	Composite	8 samples. Dynamometer unleaded, closed - loop catalyst, cold start.
N100	MUCCS	F	Composite	4 samples. Dynamometer unleaded, closed - loop catalyst, cold stabilized.
N101	MUCCH	F	Composite	3 samples. Dynamometer unleaded, closed - loop catalyst, hot transient.
N102	MUOCC	F	Composite	14 samples. Dynamometer unleaded, oxidation catalyst, cold start.
N103	MUOCS	F	Composite	8 samples. Dynamometer unleaded, oxidation catalyst, cold stabilized.
N104	MUOCH	F	Composite	5 samples. Dynamometer unleaded, oxidation catalyst, hot transient.
N105	MUCC	F	Composite	22 samples. Dynamometer unleded, both catalyst types, cold start.
N106	MUCS	F	Composite	12 samples. Dynamometer unleded, both catalyst types, cold stabilized.
N107	MUCH	F	Composite	8 samples. Dynamometer unleded, both catalyst types, hot transient.
N108	MD50U50S	F	Composite	21 samples. Dynamometer, 50% diesel, 50% unleaded , cold stabilized
N109	MD75U25S	F	Composite	21 samples. Dynamometer, 75% diesel, 25% unleaded , cold stabilized
N110	MD95U5S	F	Composite	21 samples. Dynamometer, 95% diesel, 5% unleaded , cold stabilized
N111	ML50U50S	F	Composite	22 samples. Dynamometer, 50% leaded, 50% unleaded , cold stabilized
N112	ML25U75S	F	Composite	22 samples. Dynamometer, 25% leaded, 75% unleaded , cold stabilized
N113	ML5U95S	F	Composite	22 samples. Dynamometer, 5 % leaded, 95% unleaded , cold stabilized
N114	MD5L2U3S	F	Composite	31 samples. Dynamometer, 50% diesel, 20% leaded, 30% unleaded, cold stabilized.
N115	MD7515US	F	Composite	31 samples. Dynamometer, 75% diesel, 15% leaded, 10% unleaded, cold stabilized.
N116	MD8510US	F	Composite	31 samples. Dynamometer, 85% diesel, 10% leaded, 5% unleaded, cold stabilized.
N117	MD3035US	F	Composite	31 samples. Dynamometer, 30% diesel, 35% leaded, 35% unleaded, cold stabilized.
N118	MD3050US	F	Composite	31 samples. Dynamometer, 30% diesel, 50% leaded, 20% unleaded, cold stabilized.
N119	PCHKC04	F		Cherokee Pow. Pt., #4 boiler burning coal, mech. collector., elec. precipitator, wet scrubber.
N120	PCOOR01	F		Adolph Coors Co., #5 boiler burning coal and brewery sludge, wet scrubber.
N121	PCHKG03	F		Cherokee Pow. Pt., #3 boiler burning natural gas, no control equipment.
N122	PCHKC03	F		Cherokee Pow. Pt., #3 boiler burning coal, baghouse.
N123	PCHCLC1	F		Composite, PCHKC03 & PCHKC04, boilers burning coal.
N124	PCOALC2	F		Composite, PCHKC03, PCHKC04 & PCOOR01, boilers burning coal.
N125	CCRCSC1	F		Composite, 3 samples. Fluidized Catalytic Cracker (FCC) regenerator.
N126	WFPLL01	F		Fireplace, low burn rate.
N127	WFPLH02	F		Fireplace, high burn rate.
N128	WWSIN03	F		Fireplace insert (treated as woodstove).
N129	WWSTC04	F		Woodstove, thermostatically controlled.
N130	WWSLF05	F		Woodstove, large firebox.
N131	WWSSF06	F		Woodstove, small firebox.
N132	WFIREC1	F		Composite of two fireplace tests.
N133	WSTOVC2	F		Composite of four woodstove tests.
N134	WRWCBC3	F		Composite of all six tests.

Table C.1-3
Sensitivity Test Results for NFRAQS Wood Combustion, Meat Cooking, Tire Wear, and Brake Dust

Data		W01	W02	W03	W04	W05	W06	W07	W08	W09	W10	W11	W12	W13	W14	W15	W16
Concentration		10.05	10.05	10.05	10.05	10.05	10.05	10.05	10.05	10.05	10.05	10.05	10.05	10.05	10.05	10.05	10.05
R-square		0.91	0.91	0.91	0.91	0.90	0.91	0.91	0.91	0.90	0.91	0.90	0.90	0.91	0.90	0.90	0.90
Chi Square		0.61	0.61	0.67	0.63	0.66	0.56	0.57	0.62	0.67	0.61	0.64	0.65	0.61	0.67	0.66	0.67
% mass		97.73	97.88	97.18	97.74	97.51	98.15	98.03	98.05	98.15	98.11	98.20	98.20	98.26	98.15	98.15	97.79
Brakewear		0.00	0.01	0.01	0.02	0.01	0.01	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01
Tiredust		-0.05	0.03	-0.02	0.08	-0.12	-0.12	-0.19	-0.04	-0.04	-0.06	-0.02	-0.02	-0.01	-0.05	-0.01	-0.05
WOOD STOVE	wshc2	0.95															
	wshdhl		0.61														
	wshdlh			0.55													
	wsodhla				0.78												
	wsowhl					1.08											
FIREPLACE	wfsc						0.45										
softwood	wfpgda							0.28									
softwood	wfend								0.57								
apple/mesqute	wfgamd									0.05							
hardwood	wfghd										0.26						
hardwood	wfhc											0.06					
hardwood	wfehd												0.07				
hardwood	wfghd2													0.07			
hardwood	wfgod														0.04		
hardwood	wfgow															0.04	
synthetic log	wfgdd																1.68

Data		W17	W18	W19	W20	W21	W22	W23	W24	W25	W26	W27	W28	W29	W30	W31
Concentration		10.05	10.05	10.05	10.05	10.05	15.70	15.70	15.70	15.70	15.70	52.80	52.80	52.80	52.80	52.80
R-square		0.91	0.92	0.91	0.92	0.91	0.91	0.92	0.94	0.97	0.97	0.96	0.97	0.97	0.97	0.98
Chi Square		0.58	0.54	0.56	0.46	0.58	0.72	0.75	0.48	0.64	0.29	0.26	0.23	0.23	0.52	0.25
% mass		98.21	97.86	98.04	99.34	98.37	90.50	88.70	87.50	86.90	88.50	95.00	94.20	94.70	93.10	95.60
WOOD STOVE	wshc2__	0.42	0.96	0.77	0.75		1.13	1.17	4.21	4.22	7.63	1.02	1.10	1.66	10.36	1.70
FIREPLACE	nwfsc___	0.29	0.25	0.25	0.62	0.33	0.70	0.72	0.10		0.13	-0.13	-0.14	1.33		1.10
hardwood	nwfhc___		-0.03			0.02										
apple/mesq.	nwfgamd_			-0.02												
synthetic log	nwfgdd__				-6.27											
MEAT COOKING	NMC						1.84	2.20	1.66		-4.80	1.20	1.83	1.62		0.38
Smoker							0.37	-0.13	-2.41		1.60	9.12	8.11	6.93		8.62

Data		M01	M02	M03	M04	M05	M06	M07	M08	M09	M10	M11	M12	M13	M14	M15	M16
Concentration		10.05	10.05	10.05	10.05	10.05	10.05	10.05	10.05	10.05	10.05	10.05	10.05	10.05	10.05	7.28	12.83
R-square		0.90	0.90	0.90	0.90	0.90	0.91	0.92	0.92	0.91	0.90	0.90	0.90	0.90	0.91	0.92	0.89
Chi Square		0.62	0.62	0.61	0.63	0.63	0.59	0.52	0.55	0.55	0.60	0.66	0.68	0.59	0.63	0.53	0.73
% mass		97.82	97.98	97.82	97.91	97.76	100.11	103.20	106.18	100.23	98.23	98.87	99.81	128.66	98.40	94.72	102.07
Smoker		3.37	3.74	3.49	3.17	3.30	4.87	4.73	5.11	4.56		3.52	2.70	6.03	3.40	4.92	1.87
MEAT COOKING		1.19									2.14		0.84	2.99	1.07	0.51	1.63
hambu.au--char.	NMAH		1.40				1.51	11.11	10.15	2.92							
hambu.-char.	NMCH			1.29						5.60							
Chicken	NMCC				0.93		2.27		2.05								
Steak	NMCK					1.46		3.94	2.21								

Table C.1-4a
Sensitivity Test 1 – Variation among Winter Fleet Non-Smoking Light-Duty Gasoline Samples

Data	Ld01	Ld02	Ld03	Ld04	Ld05	Ld06	Ld07	Ld08	Ld09	Ld10	Ld11	Ld12
conc	10.0519	10.0519	10.0519	10.0519	10.0519	10.139	10.0519	10.139	10.139	10.0519	10.0519	10.0519
rsquar	0.83842	0.83421	0.86778	0.83864	0.83105	0.90738	0.83503	0.8618	0.89731	0.86979	0.87441	0.88181
chisquar	1.35034	1.42857	1.65718	1.352	1.43744	1.19057	1.43105	1.29489	1.23796	1.63485	1.45622	1.48312
pcmass	106.255	105.32	100.387	106.221	105.617	94.8588	105.278	94.2145	98.5337	99.2319	94.2723	99.7701
nwsap2	16.011	15.039	7.9721	15.9233	15.2193	6.30854	14.8928	12.65	9.05277	4.65416	6.1906	4.79875
nwhdc	5.48948	5.50004	4.44471	5.48731	5.49674	3.22709	5.46643	4.44799	4.24244	4.39946	4.95113	3.49096
nmc	0.37429	0.3905	0.46168	0.3686	0.38319	0.58844	0.42434	0.58087	0.24325	1.01687	0.93981	0.58666
l1p2	0.04238											
l1p3		0.16124										
l2p1			1.51502									
l2p2				0.04071								
l2p3					0.1155							
ml1p1						3.17871						
ml1p2							0.15053					
ml1p3								2.3874				
ml2p1									1.41153			
ml2p2										0.76938		
ml2p3											0.92692	
m1p1												6.61678

Data	Ld13	Ld14	Ld15	Ld16	Ld17	Ld18	Ld19	Ld20	Ld21	Ld22	Ld23	Ld24	Ld25
conc	10.0519	10.0519	10.139	10.0519	10.0519	10.0519	10.0519	10.0519	10.0519	10.0519	10.139	10.0519	10.0519
rsquar	0.83502	0.86449	0.87069	0.83165	0.83647	0.89765	0.83699	0.85849	0.85233	0.86132	0.88568	0.8407	0.839
chisquar	1.74487	1.76603	1.302	1.7798	1.52144	1.38944	1.34208	1.75098	1.71101	1.82851	1.27134	1.15209	1.66175
pcmass	103.337	97.8733	95.141	102.571	99.7932	98.0205	106.338	99.0648	99.5397	100.565	96.2705	107.773	99.4636
nwsap2	10.4002	3.6438	12.2799	11.7986	14.0776	2.26879	16.2602	5.55055	12.2171	5.35178	8.14526	17.4393	11.0658
nwhdc	5.24268	4.13197	4.28494	5.30011	4.82692	2.39171	5.47109	4.59768	2.86594	4.30609	4.53107	10.2462	5.11952
nmc	0.43626	0.98126	0.43805	0.3025	0.33783	1.30709	0.45362	0.63871	0.51235	0.63959	0.38247	0.36225	0.51589
m1p2	0.7232												
m1p3		4.80962											
m2p1			2.2233										
m2p2				0.71909									
m2p3					1.44232								
m3p1						4.97702							
m3p2							0.04901						
m3p3								1.68004					
h1p1									3.55764				
h1p2										1.1196			
h1p3											1.03951		
h2p2												0.6532	
h2p3													1.2444

Table C.1-4b
Sensitivity Test 2 – Winter Smoking Vehicles. Variance Between Phases and Samples

Data	sm01	sm02	sm03	sm04	sm05	sm06	sm07	sm08	sm09
conc	10.0519	10.0519	10.0519	10.0519	10.0519	10.0519	10.0519	10.0519	10.0519
rsquar	0.9147	0.91134	0.905	0.91066	0.91348	0.91178	0.91034	0.91267	0.91298
chisquar	0.59024	0.72398	0.70962	0.63428	0.60916	0.62058	0.65211	0.61915	0.62375
pcmass	98.1262	99.551	96.9759	96.7422	97.0115	96.2996	97.2347	97.1352	96.7265
nmc	1.67823	1.49021	1.91584	1.47869	1.18331	1.42097	1.36346	1.24814	1.35807
nwhdc	1.03415	1.46619	1.035	1.70008	1.9205	1.89855	1.70467	1.89047	1.9331
nwlcp1	3.77288	2.46465	2.88152	3.30486	3.5236	3.39171	3.31	3.4743	3.32002
nwlcp2	0.31082	0.07515	0.36067	0.34669	0.19201	0.31655	0.24171	0.14429	0.22741
s1p1	0.60249								
s1p2		1.91279							
s1p3			1.77992						
s2p1				3.51764					
s2p2					3.02012				
s2p3						3.46521			
s3p1							3.55204		
s3p2								3.06091	
s3p3									3.35834

Table C.1-4c
Sensitivity Test 3 – Heavy-Duty Diesel Using Samples with Varying Amounts of OC/EC Ratio
(the first five with source elimination off, and the second five with source elimination on)

Data	hd01	hd02	hd03	hd04	hd05	hd06	hd07	hd08	hd09	hd10
conc	10.139	10.139	10.139	10.139	10.139	10.139	10.139	10.139	10.139	10.139
uconc	0.75746	0.75746	0.75746	0.75746	0.75746	0.75746	0.75746	0.75746	0.75746	0.75746
rsquar	0.93213	0.93297	0.93335	0.93024	0.93333	0.92835	0.92836	0.92898	0.9249	0.92879
chisquar	0.46098	0.45728	0.46501	0.45465	0.46169	0.49149	0.49676	0.50067	0.50175	0.50027
pcmass	96.1546	95.5623	96.1459	97.577	96.2716	96.5534	95.8864	96.5236	97.2339	96.4534
nwlcp1	3.4497	3.70352	3.39213	4.14444	3.51082	3.8218	4.02063	3.75526	4.3564	3.83159
nwlcp2	0.17149	0.18182	0.16882	0.16931	0.17123	0.24892	0.25014	0.2497	0.26595	0.24864
nwsap2	3.50066	2.77209	3.65039	2.17216	3.42965	3.21284	2.65856	3.37497	2.04094	3.2648
nmc	1.00183	1.21673	1.0269	1.10095	1.1043	1.38133	1.44147	1.46795	1.27946	1.58992
nwhdc	2.05357					1.89585				
hdd6		2.06046					2.223			
hdd8			1.87194					1.74627		
hdd15				0.96884					1.11695	
hdd32					1.7336					1.68363

Table C.1-5
NFRAQS CMB Sensitivity Tests for Mobile Source Profiles

Data	T01	T02	T03	T04	T05	T06	T07	T08	T09	T10	T11	T12	T13	T14
$PM_{2.5}$ mass average	23.18	23.18	22.68	22.68	20.52	22.47	22.68	22.68	22.68	22.68	22.68	22.68	22.68	21.76
Average of rsquar[a]	0.90	0.90	0.87	0.88	0.87	0.86	0.90	0.90	0.91	0.90	0.90	0.80	0.78	0.89
Average of chisquar[a]	1.05	1.06	1.30	1.41	1.41	2.06	0.89	0.90	0.94	0.90	0.90	3.87	3.42	0.90
Average of pcmass[a]	98.67	98.47	107.95	105.48	105.56	105.70	99.50	98.96	101.00	98.93	98.83	133.59	133.39	99.66
Average of nwlcp1	3.98	3.88												
Average of nwlcp2		0.18			0.52									
Average of nwhcp1			5.91	5.24	4.65									
Average of nwhcp2				0.31	0.26									
Average of nwhcpc						3.98								
Average of nwnsp1							5.58	5.41	2.81	5.43	5.34			5.45
Average of nwnsp2								0.29	0.14	0.30	0.29			0.25
Average of nwsap1												12.95		
Average of nwsap2	3.26	3.26	3.23	2.78	3.00	3.53	2.48	2.43	2.11	2.38	2.60			
Average of nwsap3													12.39	
Average of nwsapc														2.49
Average of nwldcpc									3.87					
Average of nwhdc	1.84	1.71	1.88	2.11	1.81	2.94	1.57	1.59				2.29	2.93	1.16
Average of nwhdbc										1.43				
Average of nwhdoc											1.56			
Average of nmc	0.62	0.63	0.92	0.95	0.68	0.59	0.61	0.65	0.75	0.64	0.55	0.95	0.26	0.57
Average of nwfsc	0.84	0.84	0.84	0.76	0.79	0.62	0.89	0.88	0.72	0.88	0.88	0.51	0.51	0.89
Average of nwshc	0.34	0.34	0.46	0.47	0.36	0.53	0.42	0.42	0.45	0.42	0.42	0.62	0.68	0.47
Average of nrdc	1.96	1.96	2.05	2.09	1.87	2.30	1.88	1.88	2.26	1.88	1.90	2.42	2.36	1.72
Average of amsul	3.12	3.12	2.99	2.99	2.72	3.00	2.95	2.95	2.96	2.95	2.96	2.97	2.98	2.85
Average of amnit	7.85	7.85	7.55	7.55	7.11	7.09	7.56	7.56	7.55	7.56	7.56	7.55	7.53	6.87

[a]Unitless

Table C.1-6
Example CMB Output File

```
SOURCE CONTRIBUTION ESTIMATES -  SITE: BRIGHT       DATE: 12/19/96     CMB 8.0
SAMPLE DURATION        6       START HOUR        06        SIZE:    F
       R SQUARE       .90    PERCENT MASS      99.8
     CHI SQUARE       .70              DF        77


SOURCE
EST CODE   NAME     SCE(UG/M3)    STD ERR      TSTAT
-----------------------------------------------------
YES N017   NWnSP1      2.37386     .78735    3.01499
YES N018   NWnSP2       .15070     .18302     .82341
YES N026   NWSaP2      4.42760     .90387    4.89851
YES N033   NWHDc        .82546     .70950    1.16344
YES N041   NWFSc        .49081     .26611    1.84438
YES N052   NWSHc        .18699     .20534     .91066
YES N059   NRDC         .75462     .26797    2.81604
YES N065   AMSUL       2.17201     .24621    8.82181
YES N067   AMNIT       3.88514     .38971    9.96922
-----------------------------------------------------

MEASURED CONCENTRATION FOR SIZE: F
      15.3+-     1.0

ELIGIBLE SPACE DIM. =   9 FOR MAX. UNC. =  3.05912  (20.% OF TOTAL MEAS. MASS)

1 / SINGULAR VALUE
-------------------------------------------------------------------------------
  .10185    .17732    .23178    .26067    .28093    .39837    .48565    .78587
 1.05665
-------------------------------------------------------------------------------

NUMBER ESTIMABLE SOURCES =   9 FOR MIN. PROJ. =   .95
 PROJ. SOURCE   PROJ. SOURCE   PROJ. SOURCE   PROJ. SOURCE   PROJ. SOURCE
-------------------------------------------------------------------------------
1.0000 N017    1.0000 N018    1.0000 N026    1.0000 N033    1.0000 N041
1.0000 N052    1.0000 N059    1.0000 N065    1.0000 N067
-------------------------------------------------------------------------------

ESTIMABLE LINEAR COMBINATIONS OF INESTIMABLE SOURCES
COEFF. SOURCE  COEFF. SOURCE  COEFF. SOURCE  COEFF. SOURCE   SCE         STD ERR
-------------------------------------------------------------------------------
-------------------------------------------------------------------------------

SPECIES CONCENTRATIONS -  SITE: BRIGHT       DATE: 12/19/96       CMB 8.0
SAMPLE DURATION        6       START HOUR        06        SIZE:    F
       R SQUARE       .90    PERCENT MASS      99.8
     CHI SQUARE       .70              DF        77

SPECIES-------I---MEAS------------------CALC-------------RATIO C/M----RATIO R/U
MSGC   MSGU     15.29560+-  .96830 15.26719+-  .96448   1.00+-  .09      .0
CLIC   CLIU       .07130+-  .04540   .02577+-  .01997    .36+-  .36     -.9
N3IC   N3IU   *  3.14060+-  .20005  3.03028+-  .30125    .96+-  .11     -.3
S4IC   S4IU   *  1.66920+-  .10920  1.62848+-  .15962    .98+-  .11     -.2
N4CC   N4CU   *  1.41240+-  .08040  1.47113+-  .11744   1.04+-  .10      .4
KPAC   KPAU   *   .03930+-  .00460   .00480+-  .05102    .12+- 1.30     -.7
TCTC   TCTU      6.87450+-  .60979  7.29676+-  .23741   1.06+-  .10      .6
OCTC   OCTU   *  4.85110+-  .54030  5.30863+-  .36116   1.09+-  .14      .7
ECTC   ECTU   *  2.02340+-  .28270  1.98813+-  .35458    .98+-  .22     -.1
```

Table C.1-6 (continued)
Example CMB Output File

SPECIES	-------I	---	MEAS	----------	CALC	----------	RATIO C/M	----	RATIO R/U
NAXC	NAXU	*	.03170+-	.03100	.01465+-	.04617	.46+-	1.52	-.3
MGXC	MGXU	*	.00620<	.02750	.00785<	.04512	1.27<	9.19	.0
ALXC	ALXU	*	.02810+-	.00830	.04512+-	.05092	1.61+-	1.87	.3
SIXC	SIXU	*	.12510+-	.01030	.14256+-	.07636	1.14+-	.62	.2
PHXC	PHXU	*	.00550<	.00950	.00642<	.04521	1.17<	8.46	.0
SUXC	SUXU		.65340+-	.03320	.56409+-	.05363	.86+-	.09	-1.4
CLXC	CLXU	*	.01750+-	.00650	.02916+-	.01910	1.67+-	1.25	.6
KPXC	KPXU	*	.05360+-	.00570	.02713+-	.01424	.51+-	.27	-1.7
CAXC	CAXU	*	.03190+-	.00610	.03590+-	.01462	1.13+-	.51	.3
TIXC	TIXU	*	.00000<	.02890	.00199<	.01280	.00<	.00	.1
VAXC	VAXU	*	.00000<	.01590	.00013<	.00579	.00<	.00	.0
CRXC	CRXU	*	.00000<	.00480	.00071<	.00116	.00<	.00	.1
MNXC	MNXU	*	.00120<	.00250	.00072<	.00089	.60<	1.45	-.2
FEXC	FEXU	*	.04630+-	.00390	.06282+-	.03330	1.36+-	.73	.5
NIXC	NIXU	*	.00310+-	.00110	.00028+-	.00060	.09+-	.19	-2.3
CUXC	CUXU		.00210+-	.00100	.00155+-	.00084	.74+-	.53	-.4
ZNXC	ZNXU		.02330+-	.00170	.01394+-	.00726	.60+-	.31	-1.3
ASXC	ASXU	*	.00220+-	.00190	.00008+-	.00116	.04+-	.53	-1.0
SEXC	SEXU	*	.00060<	.00130	.00002<	.00053	.03<	.88	-.4
BRXC	BRXU	*	.00270+-	.00090	.00099+-	.00130	.37+-	.50	-1.1
RBXC	RBXU	*	.00000<	.00110	.00011<	.00056	.00<	.00	.1
SRXC	SRXU	*	.00030<	.00120	.00025<	.00068	.84<	4.07	.0
ZRXC	ZRXU	*	.00020<	.00180	.00012<	.00066	.61<	6.40	.0
HGXC	HGXU	*	.00000<	.00290	.00005<	.00084	.00<	.00	.0
PBXC	PBXU	*	.00180<	.00370	.00521<	.00392	2.89<	6.34	.6
NAPHTH	NAPHTH		.58371+-	.03408	.59004+-	.22724	1.01+-	.39	.0
MNAPH2	MNAPH2	*	.15940+-	.00930	.26885+-	.11836	1.69+-	.75	.9
MNAPH1	MNAPH1	*	.08748+-	.00538	.14476+-	.06362	1.65+-	.73	.9
DMN267	DMN267	*	.04429+-	.00370	.03169+-	.01138	.72+-	.26	-1.1
DM1367	DM1367		.12056+-	.00850	.04835+-	.01672	.40+-	.14	-3.8
D14523	D14523	*	.03113+-	.00417	.01611+-	.00512	.52+-	.18	-2.3
DMN12	DMN12U	*	.01173+-	.00237	.00743+-	.00260	.63+-	.26	-1.2
BIPHEN	BIPHEN		.03683+-	.00221	.01157+-	.00431	.31+-	.12	-5.2
M_2BPH	M_2BPH		.01097+-	.00086	.00091+-	.00061	.08+-	.06	-9.5
M_3BPH	M_3BPH		.03254+-	.00183	.00712+-	.00195	.22+-	.06	-9.5
M_4BPH	M_4BPH		.01501+-	.00103	.00360+-	.00107	.24+-	.07	-7.7
ATMNAP	ATMNAP		.02670+-	.00183	.01146+-	.00357	.43+-	.14	-3.8
EM_12N	EM_12N		.00742+-	.00076	.00397+-	.00109	.53+-	.16	-2.6
BTMNAP	BTMNAP		.03088+-	.00230	.01219+-	.00376	.39+-	.13	-4.2
CTMNAP	CTMNAP		.03685+-	.00244	.01192+-	.00349	.32+-	.10	-5.9
EM_21N	EM_21N	*	.00108+-	.00039	.00092+-	.00052	.84+-	.57	-.3
ETMNAP	ETMNAP		.02418+-	.00218	.00826+-	.00241	.34+-	.10	-4.9
FTMNAP	FTMNAP		.02273+-	.00177	.00838+-	.00248	.37+-	.11	-4.7
GTMNAP	GTMNAP		.01348+-	.00146	.00476+-	.00137	.35+-	.11	-4.4
HTMNAP	HTMNAP	*	.00355+-	.00065	.00247+-	.00078	.70+-	.25	-1.1
TM128N	TM128N	*	.00067+-	.00042	.00084+-	.00051	1.26+-	1.10	.3
ACNAPY	ACNAPY		.01267+-	.00239	.04286+-	.01281	3.38+-	1.19	2.3
ACNAPE	ACNAPE	*	.00794+-	.00112	.00867+-	.00665	1.09+-	.85	.1
PHENAN	PHENAN		.02351+-	.00157	.04567+-	.01160	1.94+-	.51	1.9
FLUORE	FLUORE	*	.01208+-	.00115	.01548+-	.00399	1.28+-	.35	.8
A_MFLU	A_MFLU	*	.00823+-	.00081	.00667+-	.00132	.81+-	.18	-1.0
M_1FLU	M_1FLU		.00527+-	.00071	.00297+-	.00075	.56+-	.16	-2.2
B_MFLU	B_MFLU	*	.00140+-	.00039	.00156+-	.00055	1.11+-	.50	.2
C_MFLU	C_MFLU		.00646+-	.00065	.01124+-	.00281	1.74+-	.47	1.7
A_MPHT	A_MPHT	*	.00574+-	.00060	.00488+-	.00160	.85+-	.29	-.5
M_2PHT	M_2PHT	*	.00634+-	.00064	.00540+-	.00192	.85+-	.31	-.5
B_MPHT	B_MPHT		.00039+-	.00035	.00170+-	.00087	4.32+-	4.42	1.4

Table C.1-6 (continued)
Example CMB Output File

SPECIES	-------I	---MEAS	----------	----------	---CALC	----------	----------	RATIO C/M	----	RATIO R/U
C_MPHT	C_MPHT	*	.00330+-	.00045	.00351+-	.00106	1.06+-	.35		.2
M_1PHT	M_1PHT	*	.00296+-	.00044	.00364+-	.00134	1.23+-	.49		.5
DM36PH	DM36PH	*	.00074+-	.00038	.00105+-	.00059	1.43+-	1.09		.4
A_DMPH	A_DMPH	*	.00096+-	.00039	.00122+-	.00065	1.27+-	.85		.3
B_DMPH	B_DMPH	*	.00052+-	.00035	.00063+-	.00051	1.21+-	1.28		.2
C_DMPH	C_DMPH	*	.00172+-	.00036	.00215+-	.00094	1.25+-	.60		.4
DM17PH	DM17PH	*	.00071+-	.00035	.00099+-	.00058	1.39+-	1.06		.4
D_DMPH	D_DMPH	*	.00062+-	.00035	.00088+-	.00055	1.42+-	1.21		.4
E_DMPH	E_DMPH	*	.00057+-	.00038	.00087+-	.00057	1.53+-	1.45		.4
ANTHRA	ANTHRA		.00335+-	.00085	.01228+-	.00355	3.66+-	1.41		2.4
FLUORA	FLUORA		.00224+-	.00067	.01561+-	.00539	6.96+-	3.18		2.5
PYRENE	PYRENE		.00306+-	.00045	.01924+-	.00625	6.30+-	2.24		2.6
B_MPYR	B_MPYR	*	.00035<	.00035	.00037<	.00046	1.06<	1.71		.0
D_MPYR	D_MPYR	*	.00032<	.00035	.00049<	.00047	1.55<	2.23		.3
F_MPYR	F_MPYR	*	.00037+-	.00035	.00039+-	.00046	1.04+-	1.60		.0
RETENE	RETENE	*	.00020<	.00049	.00019<	.00046	.98<	3.35		.0
BAANTH	BAANTH	*	.00032<	.00101	.00073<	.00066	2.28<	7.49		.3
CHRYSN	CHRYSN	*	.00059+-	.00052	.00080+-	.00075	1.35+-	1.74		.2
BBJKFL	BBJKFL	*	.00047<	.00056	.00142<	.00119	3.03<	4.42		.7
BEPYRN	BEPYRN	*	.00042+-	.00038	.00045+-	.00056	1.09+-	1.68		.1
BAPYRN	BAPYRN	*	.00032<	.00112	.00060<	.00065	1.89<	6.89		.2
INCDPY	INCDPY	*	.00025<	.00094	.00031<	.00051	1.26<	5.26		.1
DBANTH	DBANTH	*	.00005<	.00136	.00004<	.00047	.81<	24.32		.0
BGHIPE	BGHIPE	*	.00057<	.00122	.00100<	.00104	1.76<	4.21		.3
CORONE	CORONE	*	.00037<	.00244	.00071<	.00088	1.92<	12.89		.1
GUACOL	GUACOL		.10693+-	.04044	.00760+-	.00433	.07+-	.05		-2.4
M4GUCL	M4GUCL	*	.01550+-	.00601	.01129+-	.00836	.73+-	.61		-.4
E4GUCL	E4GUCL	*	.00917+-	.00314	.00231+-	.00175	.25+-	.21		-1.9
SYRGOL	SYRGOL		.00000<	.00244	.00358<	.00128	.00<	.00		1.3
PPGUCL	PPGUCL	*	.00212+-	.00077	.00034+-	.00050	.16+-	.24		-1.9
A4GUCL	A4GUCL	*	.00311+-	.00126	.00182+-	.00125	.58+-	.47		-.7
GNONLA	GNONLA	*	.00000<	.00035	.00078<	.00102	.00<	.00		.7
F4GUCL	F4GUCL	*	.00000<	.00261	.00732<	.00378	.00<	.00		1.6
M4SYRG	M4SYRG	*	.00000<	.00195	.00148<	.00102	.00<	.00		.7
E4SYRG	E4SYRG		.00589+-	.00143	.00084+-	.00055	.14+-	.10		-3.3
ISOEUG	ISOEUG		.02891+-	.00420	.00516+-	.00248	.18+-	.09		-4.9
GDECLA	GDECLA	*	.00185+-	.00088	.00026+-	.00053	.14+-	.29		-1.6
ACETVA	ACETVA	*	.00000<	.00094	.00176<	.00114	.00<	.00		1.2
UNGLAC	UNGLAC	*	.00067+-	.00045	.00181+-	.00343	2.71+-	5.47		.3
SYRALD	SYRALD		.00424+-	.00186	.00154+-	.00128	.36+-	.34		-1.2
C27SDS	C27SDS	*	.00000<	.00042	.00021<	.00046	.00<	.00		.3
C27RDS	C27RDS	*	.00032<	.00038	.00018<	.00046	.55<	1.58		-.2
C27RAC	C27RAC	*	.00000<	.00038	.00030<	.00046	.00<	.00		.5
AB30NH	AB30NH	*	.00239+-	.00116	.00064+-	.00048	.27+-	.24		-1.4
CHLSRL	CHLSRL	*	.00000<	.00265	.00001<	.00045	.00<	.00		.0
BA30NH	BA30NH	*	.00027<	.00038	.00060<	.00059	2.21<	3.82		.5
AB_HOP	AB_HOP	*	.00195+-	.00102	.00052+-	.00047	.27+-	.28		-1.3
BA_HOP	BA_HOP	*	.00091+-	.00056	.00026+-	.00049	.28+-	.57		-.9
SABHHP	SABHHP	*	.00108+-	.00066	.00003+-	.00046	.03+-	.42		-1.3
RABHHP	RABHHP	*	.00062+-	.00042	.00002+-	.00046	.04+-	.74		-1.0
STEROM	STEROM		.08883+-	.05727	.00002+-	.00045	.00+-	.01		-1.6
SABBHH	SABBHH	*	.00057+-	.00045	.00002+-	.00046	.04+-	.80		-.8
RABBHH	RABBHH	*	.00138+-	.00070	.00002+-	.00070	.01+-	.51		-1.4
CO	COU		.00000<	.10000	3.09103<	1.67521	.00<	.00		1.8
NOX	NOXU		.07161+-	.01230	.12506+-	.08230	1.75+-	1.19		.6
SO2	SO2U		16.69000+-	5.27100	3.63473+-	1.99908	.22+-	.14		-2.3

Table C.1-7
Calculated Atmospheric Lifetimes for Gas-Phase Reactions of Selected Gas-Phase Compounds with Atmospherically Important Reactive Species

Compound	Atmospheric Lifetime Due to Reaction with:				
	OH[a]	**O_3[b]**	**NO_3[c]**	**HO_2[d]**	**hν[e]**
NO_2	2 days	12 hr	1 hr	2 hr	2 min
NO	4 days	1 min	3 min	20 min	-
HNO_3	180 days	-	-	-	-
SO_2	26 days	>200 yr	>4x10^4 yr	>600 yr	-
NH_3	140 days	-	-	-	-
Propane	19 days	>7,000 yr	-	-	-
n-Butane	9 days	>4,500 yr	9 yr	-	-
n-Octane	3 days	-	3 yr	-	-
Ethylene	3 days	9 days	3 yr	-	-
Propylene	11 hr	1.5 days	15 days	-	-
Acetylene	30 days	6 yr	>14 yr	-	-
Formaldehyde	3 days	>2x10^4 yr	210 days	23 days	4 hr
Acetaldehyde	1 day	>7 yr	50 days	-	60 hr
Benzaldehyde	2 days	-	60 days	-	-
Acrolein	1 day	60 days	-	-	-
Formic acid	50 days	-	-	-	-
Benzene	18 days	600 yr	>16 yr	-	-
Toluene	4 days	300 yr	9 yr	-	-
m-Xylene	11 hr	75 yr	2 yr	-	-
Phenol	10 hr	-	20 min	-	-
Naphthalene	1 day	>80 days	80 days	-	-
2-Methylnaphthalene	5 hr	>40 days	35 days	-	-
2,3-Dimethylnaphthalene	4 hr	>40 days	20 days	-	-
Acenaphthene	2 hr	>30 days	~3 hr	-	-
Acenaphthylene	2 hr	~50 min	13 min	-	-
Phenanthrene	9 hr	-	-	-	-
Anthracene	2 hr	-	-		-
Fluoranthene[f]	6 hr	-	64 days	-	-
Pyrene[f]	6 hr	-	20 days	-	-

[a] For 12-hr average concentration of OH radical of 1 x 10^6 molecule/cm^3.
[b] For 24-hr average O_3 concentration of 7 x 10^{11} molecule/cm^3.
[c] For 12-hr average NO_3 concentration of 2 x 10^8 molecule/cm^3.
[d] For 12-hr average HO_2 concentration of 10^8 molecule/cm^3.
[e] For solar zenith angle of 0°.

[g] Lifetimes calculated from kinetic data given in Atkinson et al., 1990.

C.2 SIMULATING PARTICLE EQULIBRIUM COMPOSITION

The Simulating Composition of Atmospheric Particles at Equilibrium (SCAPE) model is used to evaluate the effects of changes in concentrations of precursor gases on ammonium nitrate concentrations. This section describes the SCAPE formulation, the NFRAQS data to which it was applied, and the results of evaluation tests that were undertaken to evaluate the simulation method and its input data.

C.2.1 SCAPE Formulation and Assumptions

The Simulating Composition of Atmospheric Particles at Equilibrium (SCAPE) model (Kim et al., 1993a, 1993b; Kim and Seinfeld, 1995) apportions sodium, nitrate, sulfate, ammonium, and chloride among gas, liquid, and solid phases using thermodynamic equilibrium theory. SCAPE-2 (Kim and Seinfeld, 1995), the simulation applied in NFRAQS, is the most recent formulation of inorganic atmospheric particle equilibrium theories and empirical studies in ambient air (Basset and Seinfeld, 1983, 1984; Blanchard et al., 1997; Harrison and MacKenzie, 1990; Harrison et al., 1990; Hildemann et al., 1984; Larson and Taylor, 1983; Matsumoto and Tanaka, 1996; Mita, 1979; Mozurkewich, 1993; Pilinus and Seinfeld, 1987; Pio and Harrison, 1987; Russell and Cass, 1986; Russell et al., 1983; Saxena et al., 1986, 1993; Stelson and Seinfeld, 1982a, 1982b, 1982c; Stelson et al., 1979; Watson et al., 1994; Wexler and Seinfeld, 1990, 1991, 1992; Wexler et al., 1992).

SCAPE apportions sodium, nitrate, sulfate, ammonia, ammonium, calcium, potassium, magnesium, carbonates, and chloride among gas, liquid, and solid phases. The constituents considered by SCAPE are:

- **Gas Phase:** NH_3, HCl, HNO_3, H_2O,
- **Liquid Phase:** H_2O, H^+, NH_4^+, Na^+, OH^-, NO_3^-, Cl^-, SO_4^{2-}, HSO_4^-, H_2SO_4, NH_3, CO_2, HCO_3^- , $CO3^{2-}$.
- **Solid Phase:** $NaHSO_4$, NaCl, $NaNO_3$, NH_4Cl, NH_4NO_3, $(NH_4)_2SO_4$, NH_4HSO_4, $(NH_4)_3H(SO_4)_2$, Ca^{2+}, K^+, and Mg^{2+}.

Concentrations of these constituents are combined in a set of equilibrium reactions based on conservation of mass and electroneutrality to obtain the equilibrium solution. The Kelvin effect is ignored, and there is no aerosol size segregation. Particles are assumed to be mono-disperse and internally mixed. This simplification is justified in this application to study changes in particle nitrate concentrations in response to changes in total ammonia and sulfate concentrations. Particle constituents are also assumed to be in thermodynamic equilibrium with the gas phase. Wexler and Seinfeld (1990) observe that this assumption may not always be justified, but is evidently valid for polluted inland conditions. SCAPE assumes that sulfuric acid formed in the gas phase rapidly nucleates, condenses on existing aerosol surfaces, and reacts with available ammonia. The sulfur salts may be in a fully or partially saturated solution, depending on the relative humidity, temperature, and availability of ammonia.

For the NFRAQS application, SCAPE reactions couple the nitrate/ammonia/ sulfate chemical system. Sulfate and nitrate compete for the available ammonia. Ammonia is preferentially scavenged by sulfate, rather than nitrate, to form ammonium sulfate. Significant amounts of ammonium nitrate are formed only when the total ammonia exceeds the sulfate by a factor of two or more (on a mole basis). In an ammonia-limited environment, reducing ammonium sulfate concentrations by one molecule might increase ammonium nitrate concentrations by up to two molecules. The ammonia that is not scavenged by sulfate is referred to as "free ammonia."

The most important SCAPE component for the Northern Front Range is the combination of nitric acid and ammonia that forms ammonium nitrate. The equilibrium constant for this reaction is both relative humidity (RH) and temperature dependent (Stelson and Seinfeld, 1982a). Ammonium nitrate formation is favored under conditions of high relative humidity and low temperature, and these conditions were common during the NFRAQS Winter 97 intensive operating period.

Aqueous ammonium nitrate forms at or above the relative humidity of deliquescence (RHD), >62% at 25°C. Solid ammonium nitrate forms below the relative humidity of deliquescence. The amount of solid ammonium nitrate is determined from the amount above the equilibrium concentration of nitric acid and free ammonia. The relative humidity of deliquescence has an inverse temperature dependence as described by Stelson and Seinfeld (1982b). SCAPE also includes pathways for the dissolution of nitric acid into the liquid water of wetted aerosols; the direct dissolution of nitric acid is important at high (>90%) relative humidities. Relative humidities between 62% and 90% were encountered during the NFRAQS Winter 97 intensive operating period.

Another pathway for the formation of nitrate aerosol consists of the reactions that convert nitric acid to hydrochloric acid and generate thermally stable nitrates such as sodium nitrate (Pilinus and Seinfeld, 1987; Russell and Cass, 1984; Mamane and Mehler, 1989; Pio and Harrison, 1987). These reactions are believed to be the principal source of coarse particle (2.5 to 10 μm) nitrate, and they occur when sodium chloride (from sea salt, road sanding, or dry lake beds) is an abundant atmospheric constituent. Marine air is not present along the Northern Front Range, so this pathway is not significant for nitrate formation.

Ammonium sulfate and other sulfate end-products are solids below 40% relative humidity (at 25°C). These salts exhibit hysteresis wherein an aqueous solution can exist in a supersaturated state below the relative humidity of deliquescence. The sulfate output by SCAPE is identical to the input value because under ambient conditions, there is no partitioning between gaseous sulfuric acid and particulate sulfate; the mixture is exclusively sulfate due to the low vapor pressure of sulfuric acid. After a sufficient reaction time, sulfate is always present as a particle of sulfuric acid, ammonium bisulfate (NH_4HSO_4), or completely neutralized ammonium sulfate ($(NH_4)_2SO_4$). Section 6 of Watson et al. (1998) shows that sulfate along the Northern Front Range is balanced by the ammonium, so all of the sulfate is in the form of ammonium sulfate.

For this application, SCAPE was embedded within a C program to allow a series of records of input data to be processed and error messages to be trapped. Input data records were read from an xBASE file and output data records were written to an xBASE file. Options are provided for three empirical methods to calculate binary activities for the solutes considered in the simulation (Bromley, 1973; Pitzer and Mayorga, 1973; Kusik and Meissner, 1978). For each record of input data, the C program first attempts a solution using the method of Kusik and Meissner (1978). If that is not successful, a solution using the method of Pitzer and Mayorga (1973) is attempted. If that is not successful, a final attempt is made using the method of Bromley (1973). This sequence is based on recommendations by Kim et al. (1993a). As the simulation is completed successfully, the method used is recorded in the output file.

C.2.2 SCAPE Input Data

Measurements of three-hour nitrate, ammonium, and gaseous nitric acid and ammonia from the Sequential Gas Sampler (SGS) at the Welby and Brighton sites were used as simulation inputs. Sulfate, sodium, chlorine, and water-soluble potassium concentrations were estimated from the collocated six-and twelve-hour samples taken with the sequential filter sampler (SFS), assuming that these longer averages were uniform over the three-hour periods that they comprised. Hourly surface temperature and relative humidity measurements at these sites were averaged over the three-hour sampling intervals to correspond to the air quality measurements.

Gaseous nitric acid and ammonia were added to particulate nitrate and ammonium to obtain total ammonia and nitrate concentrations. Input records contain measured concentrations of total ammonia as NH_3, total nitrate as HNO_3, sulfate as H_2SO_4, ionic chlorine, and ionic potassium. Since the simulation runs more reliably when the ionic species are in balance, ionic potassium was removed or ionic sodium added, as needed, to balance the ionic chlorine. The other SCAPE input species were set to zero as they were not major components of the soluble fraction in the Winter 97 aerosol. The total number of samples at both sites with complete data that were not flagged as suspicious was 164. SCAPE simulations were performed for each of these samples.

C.2.3 SCAPE Simulation and Measurement Evaluation

The SCAPE simulation and the adequacy of the input data were evaluated by comparing the gas/particle partitioning estimated by SCAPE to those measured at the Welby and Brighton sites.

First, measurement discrepancies were identified by examining potential causes of large deviations between simulated and measured particulate nitrate concentrations. This was facilitated by the six-hour and twelve-hour $PM_{2.5}$ nitrate concentrations measured by the SFS collocated with the 3-hour SGS samples at the Welby and Brighton sites.

Figure C.2-1 shows the ratio of simulated particulate nitrate to SGS-measured particulate nitrate (RNO3P) and the ratio of SGS-measured nitrate to SFS-measured nitrate

(RSNO3P) at the Welby site. Both simulated and measured agreement are reasonable for many of the samples, but there are some notable deviations. Most of these deviations from the SGS measurements are the same for the SFS and SCAPE nitrate concentrations. There are large and numerous discrepancies corresponding to the samples between 01/15/97 and 01/19/97 that cause these SGS measurements to be suspect at Level 3 validation. Several of the other cases are due to very low nitrate concentrations during one or more of the three-hour periods that possessed large uncertainty intervals.

Samples were excluded from SCAPE simulations when simultaneous particulate nitrate concentrations measured by the SGS and SFS failed to agree within two times the uncertainty intervals of both measurements. Table C.2-1 identifies the samples that were removed by this process. The total number of remaining samples to which SCAPE was applied was 110.

The second evaluation test involved a comparison between simulated and measured particle nitrate, which is shown in Figure C.2-2. This comparison shows good agreement between simulation and measurements with some disagreement for most of the samples, but there are a few outliers that were identified and investigated further with sensitivity studies.

The third evaluation test examined the sensitivity of gas/particle partitioning to possible changes in temperature and relative humidity over the three-hour sampling period. SCAPE results can be influenced by relative humidity and temperature, which affect the amount of liquid water present. Temperature can also influence SCAPE results owing to the temperature dependence of the thermodynamic constants.

Of the 110 samples in Figure C.2-2, 56 SCAPE particulate nitrate concentrations differed from SGS measured concentrations by more than twice the measurement uncertainty. For each of the 56 cases, five SCAPE calculations were executed using relative humidity and ambient temperature values for each of the three hours within the 3-hour measurement averages, plus the hour before and the hour after the 3-hour interval. SCAPE-calculated particulate nitrate was within two measurement uncertainty intervals for five of 56 samples for at least one of these equilibrium calculations.

The fourth evaluation test examined the sensitivity of gas/particle partitioning to uncertainties in ambient concentration measurements. For each of the 51 remaining samples, SCAPE was applied to eight data sets that systematically added or subtracted twice the reported measurement uncertainty to the total ammonia, total nitrate, and sulfate concentrations. Other input variables were retained at their measured amounts. Twenty-five of the 51 remaining samples yielded particulate nitrate concentrations (for at least one of the eight perturbed data sets) that agreed with measured particle nitrate within two measurement uncertainty intervals.

Particulate nitrate concentrations from the SGS and SFS measurements are presented in Table C.2-2 with SCAPE nitrate concentrations, measured temperature, and measured relative humidities for the 26 remaining samples. Table C.2-2 shows that most of the

SCAPE-calculated and SGS-measured particle nitrate concentrations do not differ by more than a factor of two. Nine of these samples show more than a factor of two difference.

In three of these cases, the SCAPE-calculated nitrated underestimated the measured nitrate. Relative humidity was low in each of these cases, and SCAPE estimated that no liquid water was associated with the nitrate. SCAPE may underestimate particulate nitrate because it underestimates liquid water. There is experimental evidence for the presence of metastable liquid water on ammonium sulfate particles for relative humidities down to approximately 30% (Tang, 1980) and on aerosol particles in the atmosphere for relative humidities down to approximately 45% (Rood, 1989).

In six of the nine cases, SCAPE overestimates particulate nitrate. Some of this overestimation may be due to ammonium nitrate volatilization in the SGS for these samples. Particle nitrate is separated from gas-phase nitrate by passing the aerosol stream through a denuder tube, which removes gas phase HNO_3 by diffusion to the denuder tube walls. Since the gas-phase vapor pressure is thus artificially reduced, the equilibrium conditions will tend to move nitrate from the particulate phase to the gas phase where it will be carried to the walls of the denuder.

Table C.2-1
Summary of Level-3-Suspect Three-Hour Sequential Gas Sampler Nitrate Concentrations

Site	Sample Date	Start Hour (MST)	SGS Nitrate ($\mu g/m^3$)	SFS Nitrate ($\mu g/m^3$)	SCAPE Nitrate ($\mu g/m^3$)
BRIGHT	12/18/96	6	0.3	1.3	1.3
BRIGHT	12/20/96	3	0.2	1.3	0.5
BRIGHT	12/25/96	6	0.1	0.2	0
BRIGHT	12/27/96	0	0.7	2.8	1.7
BRIGHT	12/27/96	3	1.3	2.8	1.2
BRIGHT	1/7/97	3	0.3	2.1	1
BRIGHT	1/14/97	9	3.8	9.2	18.6
BRIGHT	1/15/97	3	1.1	3.9	1.1
BRIGHT	1/15/97	6	0.5	1.3	1.1
BRIGHT	1/15/97	9	0	1.3	1.6
BRIGHT	1/18/97	3	0.5	6.7	0.4
BRIGHT	1/18/97	6	0.4	1.5	0.6
BRIGHT	1/19/97	6	0.7	2.6	3.9
BRIGHT	1/19/97	12	2.5	1	3.5
BRIGHT	1/19/97	15	0.3	1	0.9
BRIGHT	1/20/97	0	1.3	9.3	1.1
BRIGHT	1/20/97	3	0.1	9.3	0.8
BRIGHT	1/20/97	6	0.3	1.3	0.9
BRIGHT	1/30/97	6	0.6	1.3	1.3
BRIGHT	1/30/97	9	3.6	1.3	4.5
WELBY	12/19/96	18	5.5	2.3	4.4
WELBY	12/20/96	0	0.6	2.3	0.7
WELBY	12/20/96	3	0.4	2.3	0.6
WELBY	12/20/96	6	0.8	1.9	0
WELBY	12/25/96	6	0.5	1.2	0.5
WELBY	1/6/97	6	1.3	2.8	1.7
WELBY	1/7/97	0	0.7	1.6	0.8
WELBY	1/7/97	3	0.6	1.6	0.9
WELBY	1/8/97	0	1.2	2.6	1.4
WELBY	1/13/97	15	1.5	7.9	6.5
WELBY	1/13/97	18	1.7	7.7	9.8
WELBY	1/14/97	12	1.3	6.2	9.9
WELBY	1/14/97	15	0	6.2	2.7
WELBY	1/14/97	18	0	4.1	4
WELBY	1/15/97	0	0.1	4.1	2.9
WELBY	1/15/97	6	0	1	0
WELBY	1/15/97	9	0	1	4.5
WELBY	1/17/97	6	0	10.4	3.7
WELBY	1/17/97	9	0	10.4	10.5
WELBY	1/17/97	12	0	8.7	7
WELBY	1/18/97	3	0.4	6.2	0.2
WELBY	1/18/97	6	0.7	3.4	0
WELBY	1/18/97	9	1.1	3.4	3.6
WELBY	1/19/97	9	0.9	1.9	2.8
WELBY	1/19/97	12	0.5	1.2	1.5
WELBY	1/19/97	15	0.3	1.2	0
WELBY	1/21/97	0	0.8	2.3	0.7
WELBY	1/21/97	3	0.4	2.3	0
WELBY	1/28/97	18	6.6	2.7	6.8
WELBY	1/28/97	21	0.2	2.7	0.2
WELBY	1/29/97	0	0.9	2.7	1.2
WELBY	1/29/97	6	2.5	5.8	3.3
WELBY	1/30/97	6	0.7	1.6	1.2

Table C.2-2
Remaining Discrepencies between SCAPE-Calculated and Filter Pack (SGS)-Measured Nitrate Concentrations

Site	Sample Date	Start Hour (MST)	SCAPE Nitrate ($\mu g/m^3$)	SGS Nitrate ($\mu g/m^3$)	SCAPE/ SGS Ratio	Temp. °C	RH %	Water ($\mu g/m^3$)
BRIGHT	12/25/96	15	0	1.15	0	7.3	31.8	0
WELBY	12/20/96	9	0	2.92	0	1.9	37.8	1.03
WELBY	1/15/97	3	0.3	4.79	0.0626	0.5	37.8	0
WELBY	1/30/97	9	1.42	2.73	0.5201	6.6	31.2	0
BRIGHT	12/19/96	6	1.81	3.26	0.5552	-13.2	71.4	3.84
WELBY	1/14/97	21	4.43	7.54	0.5875	-7.8	87.1	23.01
WELBY	1/13/97	21	3.94	6.68	0.5898	-17.7	69.2	5.88
BRIGHT	2/3/97	3	2.49	3.72	0.6694	-0.5	83.1	4.98
WELBY	1/18/97	0	3.1	4.35	0.7126	-2.2	63.5	2.07
BRIGHT	12/20/96	0	0.96	0.7	1.3714	-8	60.7	0
BRIGHT	1/13/97	15	9.74	7.03	1.3855	-18.5	73.7	13.98
BRIGHT	1/14/97	15	2.75	1.95	1.4103	-9.5	85.9	13.01
BRIGHT	1/13/97	12	6.25	4.23	1.4775	-18.4	73.6	10.15
BRIGHT	2/3/97	0	4.95	3.17	1.5615	-1.3	85.5	12.09
BRIGHT	1/14/97	12	12.01	7.51	1.5992	-10.2	82.2	27.23
BRIGHT	2/2/97	21	4.9	2.83	1.7314	-0.3	82	10.21
BRIGHT	12/18/96	15	1.25	0.72	1.7361	-11.2	50.9	0.86
BRIGHT	1/29/97	0	2.9	1.57	1.8471	3.5	43.4	0
BRIGHT	1/19/97	9	4.54	2.42	1.876	2.7	62.7	3.31
BRIGHT	1/28/97	6	2.6	1.37	1.8978	-8.1	82.6	6.72
BRIGHT	1/20/97	9	3.76	1.72	2.186	5.9	53.4	0.03
BRIGHT	2/2/97	18	4.64	2.07	2.2415	3.2	70.9	5.13
BRIGHT	1/21/97	0	1.29	0.55	2.3455	3.8	55.8	0
BRIGHT	1/29/97	3	5.16	2.17	2.3779	2.3	78.2	7.29
BRIGHT	1/28/97	21	3.92	1.12	3.5	3.8	37.9	0
BRIGHT	1/20/97	12	6.51	1.85	3.5189	13.8	39.3	0

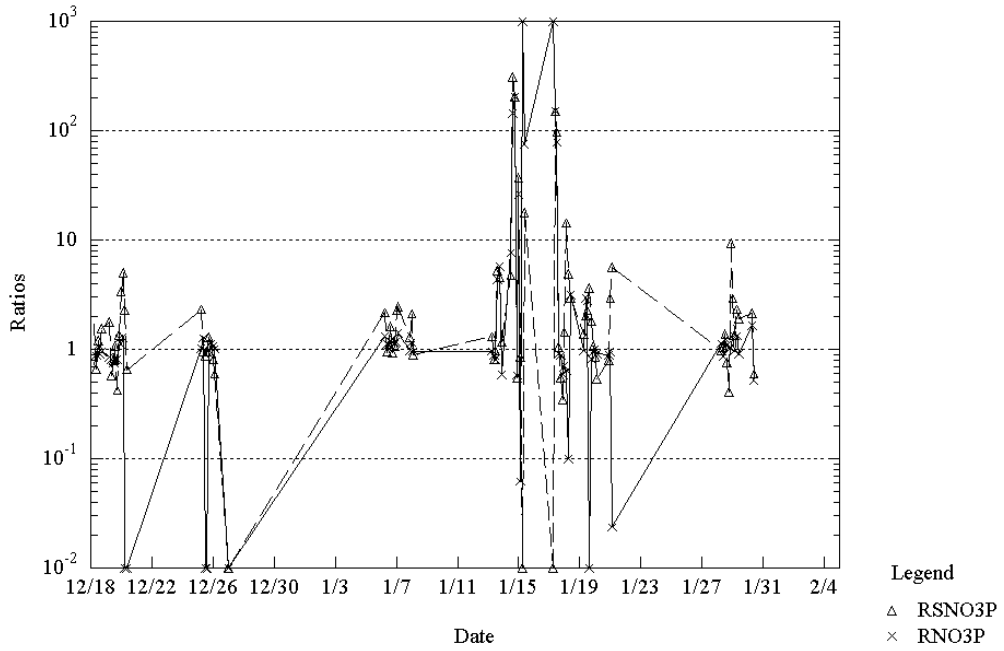

Figure C.2-1. Ratios of simulated particle nitrate to SGS particle nitrate (RSNO3P) and SFS particle nitrate to SGS particle nitrate (RNO3P) for samples taken at the Welby site. Major deviations from unity occur for both ratios on the same samples, indicating inaccuracies in the corresponding SGS measurements.

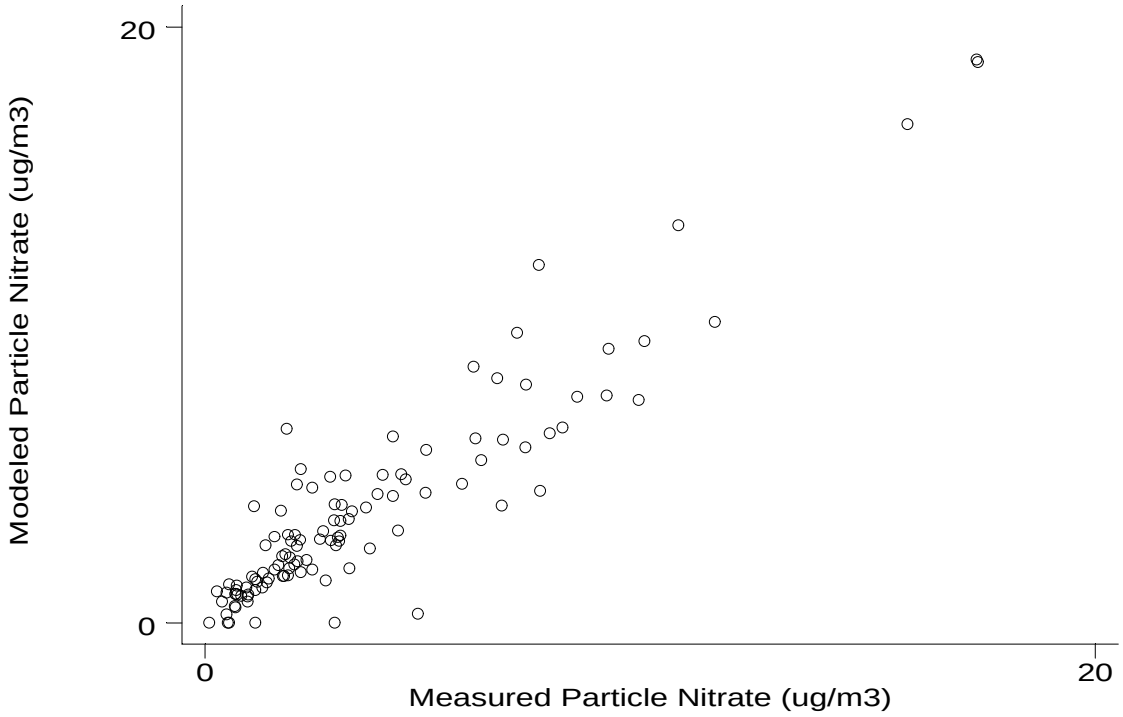

Figure C.2-2. Comparison of simulated and measured particulate nitrate for 110 samples at the Welby and Brighton sites.

C.3 TRANSPORT SIMULATIONS

Transport simulations were undertaken to determine the possibilities of air movement between identified emissions sources and NFRAQS receptors. This section explains how the transport simulations were applied, the input data that were used, and their sensitivity to measurement uncertainties and deviations from simulation assumptions.

C.3.1 CALMET, UAM, and SCIPUFF Formulation and Software

The CALMET meteorological simulator consists of a diagnostic wind field module and micro-meteorological modules for over-water and over-land boundary layers (EPA, 1995). The Urban Airshed Model (UAM) uses these windfields to simulate the movement of air between adjacent grid squares and layers.

The CALMET diagnostic module uses a two-step approach (Douglas and Kessler, 1988). In the first step, an initial-guess field is adjusted for kinematic effects of terrain, slope flows, and terrain blocking effects. The second step consists of an objective analysis procedure to introduce observational data into the Step 1 wind field to produce a final wind field. Options are provided to use gridded prognostic wind fields as: 1) the initial guess; 2) the Step 1 wind field; or 3) as "observational data". Prognostic simulations follow the time evolution of the atmospheric system through the space-time integration of the equations for conservation of mass, motion, heat, and water.

Over land surfaces, an energy balance method is used to compute hourly gridded fields of the sensible heat flux, surface friction velocity, Monin-Obukhov length, and convective velocity scale. Mixing heights are determined from the computed hourly surface heat fluxes and observed temperature soundings. Gridded fields of Pasquill/Gifford/Turner stability class and optional precipitation rates are also determined by the simulation.

CALMET contains two principal sub-modules: The Diagnostic Wind Module (DWM) and the Micro-Meteorological Module (MMM). As with all simulations of complex phenomena, each module has significant limitations with respect to representing the real world. Limitations of the diagnostic wind module are:

- While CALMET solves the incompressible mass continuity equation, the method does not explicitly conserve momentum or energy as in prognostic simulations.

- Reliability of the interpolated fields in the diagnostic wind module improves as the measurement density increases; conversely, reliability degrades where measurements are sparse.

- Experience has shown that these simulations are not reliable under light wind situations, highly stable or unstable conditions, and situations with significant vertical wind variations.

Limitations of the micro-meteorological module are:

- Micro-meteorological parameters are calculated by CALMET based on parameterizations that include many variables. Error derives from limitations in the input data, for which direct measurements are sparse or unavailable. Complex terrain greatly exacerbates this problem.
- CALMET does not include an adjustment of sun angle to account for the total terrain slope. As a result, the simulation does not properly account for differential heating of mountain slopes that can produce significant stability, mixing height, and wind direction differences over surfaces with different orientations relative to the sun.

Given these limitations, several atmospheric processes in the NFRAQS domain may not be quantitatively simulated with CALMET. Inaccurate lapse rates and uncertainties in the estimated micro-meteorological variables lead to inaccuracies in daytime convective mixing height. This is of particular concern for the NFRAQS simulations owing to the position of elevated point source plumes near the top of the surface mixed layer. Uncertainties of the mixed layer depth can result in large inaccuracies in estimates of plume location and dispersion. In the Mt. Zirkel Visibility Study in northwestern Colorado (Watson et al., 1996), however, it was found that the CALMET mixing depth estimates compared well with those determined by radar profiler measurements when such vertical, remote sensing data were available.

The CALMET was applied to six NFRAQS Winter 97 episodes: 1) 01/11/97 0000 MST to 01/21/97 0600 MST; 2) 01/27/97 0000 MST to 01/31/97 0600 MST; 3) 12/30/96 0000 MST to 01/03/97 0600 MST; 4) 12/18/96 0000 MST to 12/20/96 1200 MST; 5) 12/25/96 0000 MST to 12/27/96 0600 MST; and 6) 02/01/97 0000 MST to 02/05/97 1800 MST.

These simulations yielded estimated wind speeds and directions at many locations and elevations as well as surface mixing depths into which pollutants were released, combined, and reacted. These wind field simulations were used to estimate where concentrations at receptors came from, and to simulate the transport and dispersion of emissions from selected sources and source areas.

The horizontal domain for CALMET covered an area of 312 km (east-west) by 220 km (north-south), as shown in Watson et al. (1998). A UTM-grid was used with UTM zone 13 to specify the horizontal coordinates. The south-west corner of the grid lies at 435 km easting and 4320 km northing. The horizontal grid size used was 4 km x 4 km. The height of the highest layer was 2800 m above ground level (agl), and this contained 26 vertical layers. The first vertical cell thickness was 20 m agl, and the second cell thickness was 30 m. For the other vertical cells, 50-m-thick cells were used to 1 km height agl, 250-m-thick cells were used from 1 to 2 km agl, and the highest cell had a thickness of 800 m. This arrangement of vertical cells was used to be consistent with the vertical structure used in the gridded transport simulations.

CALMET reads a "control file" that specifies selections for the control options, input variables, and outputs. Diagnostic Wind Module (DWM) parameters are the most important in controlling the final wind fields generated using CALMET. Table C.3-1 shows the selection of options for this application and compares them with the default recommendations.

The gridded transport simulations were performed using UAM-IV. UAM-IV is an urban-scale three-dimensional photochemical air quality simulator that is most often used to simulate the evolution of ozone and other photochemical pollutants in an urban environment. For this study, the UAM-IV was applied to estimate the dispersion of primary emittants (SO_2 and NO_x) from different emitters and source areas using the CALMET meteorological outputs. The purpose of these simulations was to determine the sulfur dioxide and oxides of nitrogen emitters that most probably arrived at NFRAQS receptors. Just as important, these simulations determined which emitters did **not** provide minor, moderate, large, or major contributions to these precursors at NFRAQS receptors. These simulations were not intended to, and were not used to, estimate contributions to $PM_{2.5}$ ammonium sulfate and ammonium nitrate concentrations. They were used to eliminate certain emitters as direct and short-term contributions to secondary sulfates and nitrates at NFRAQS receptors.

The horizontal domain for UAM-IV transport simulations was the same as that described above for CALMET. The grid size used was 4 km x 4 km, which was also the same as used in the CALMET. Layers up to 2000 m agl were included. Twenty-four layers were included in the simulation, 20 below the diffusion break (diffbreak) and four above the diffusion break. The diffusion break is the turbulent mixing depth during neutral/unstable conditions and the depth of the surface based inversion during stable conditions. A minimum vertical cell height of 50 m, and a maximum vertical cell height of 250 m was used. This arrangement of vertical cells forces constant vertical levels with first 20 cells from bottom of 50 m thickness, and 4 top cells of 250 m thickness. This arrangement of vertical cells avoided a moving mesh (that can create pseudo-vertical velocities), and allowed high-resolution near the ground.

The puff transport simulations were performed using the Second-order Closure Integrated Puff (SCIPUFF) simulator (Sykes and Gabruk, 1997). SCIPUFF simulates the plume concentrations downwind of a power plant stack. It represents the plume as superposition of a series of Gaussian puffs, typically 10 seconds apart. Puffs spread as they move downstream. To eliminate unnecessary overlap and to maintain a manageable number of puffs, a merging algorithm is used. SCIPUFF uses a variable time-step algorithm which allows small time-steps at the stack exit. It also uses small spatial scales at the stack exit and larger scales away from the source. This allows an efficient computation of the wide range of scales involved in the stack emission problem.

SCIPUFF requires three-dimensional winds, three-dimensional temperatures, 2-dimensional mixing heights, 2-dimensional stability classes, and 2-dimensional heat flux. The horizontal domain used in the SCIPUFF was the same as that used in CALMET and UAM-IV. All the inputs required by the SCIPUFF were calculated using CALMET. Heat flux parameter is calculated by CALMET at the measurement stations, and not for the whole

grid. The heat flux calculated at the Brighton site was used for the whole grid in SCIPUFF as there was no significant variation from station to station.

SCIPUFF was run from 01/13/97 to 01/20/97, separately for three different power plants (Cherokee, Pawnee and Valmont). A stack parameter file was prepared for each power plant stack. This file includes the coordinates for the point of release, the amount of release, and the time and duration of the release. A series of releases were used at hourly intervals with a duration of 1 hour each to input the hourly varying emissions. Horizontal coordinates of the point of release were calculated from the location of the power plant. The vertical point of release was calculated as sum of the stack height and the plume rise. Plume rise was calculated using algorithm used in the CALPUFF simulator that uses Briggs formula and equations with wind shear effects to calculate the plume rise.

Computer animations were prepared to display the results of both the gridded and puff transport simulations. These simulations were used to visualize potential transport of elevated and surface sulfur dioxide emissions. The base map in the animations is highly simplified. The boundaries of the display are the boundaries of the domain, and only the locations of the core sites and some of the major point sources are shown.

The animations show the transport and dispersion of SO_2 for nine source groupings. The final character is a number that indicates one of nine different SO_2 sources: 1) Arapahoe coal-fired power station elevated stack; 2) Cherokee coal-fired power station elevated stack; 3) Pawnee coal-fired power station elevated stack; 4) Valmont coal-fired power station elevated stack; 5) Rawhide coal-fired power station elevated stack; 6) Trigen coal-fired power station elevated stack; 7) Conoco and Diamond Shamrock refineries combined; 8) other elevated sulfur emitters combined; and (9) surface sulfur emitters combined.

Separate animations were prepared for surface concentrations and vertically integrated burdens. The vertically integrated burdens indicate the location of the emissions without regard to their height above ground level. There are separate animations for each source individually for both the surface and vertically integrated concentrations and also animations that show the surface and vertically integrated concentrations due to all sources combined.

The computer files containing the animations are part of the NFRAQS database. The files from the gridded transport simulations have seven character names and an “avi” extension. The first five characters are the month and day of the start of the animation (e.g., jan11). The next character is “s” when the simulation shows the sulfur concentration in the surface layer and “i” when the simulation shows the vertical integration of all sulfur at all heights in that grid cell. Surface sources included mobile, area, and wood burning emissions as well as emissions from point sources with stacks less than 30 m (100 ft) high. Trigen includes more than one unit at the Coors brewery. If the final character is missing in the file name, the animation shows the sum of the concentrations from the separate sources.

Files from the puff transport simulation are named “Cher-13s.avi”, “Valm-13s.avi”, and “Pawn-13s.avi”, and show surface concentrations from Cherokee and Pawnee beginning 01/13/97. In all simulations, the color scale is logarithmic. Base-10 logarithm of

concentration are calculated and mapped to a linear color ramp from blue at the lowest concentrations to red at the highest concentrations. If the value is less than the minimum threshold, it is assigned the color black. If the value is greater than the maximum threshold, it is assigned the color white. For the surface data the minimum threshold is 0.2 ppbv and the maximum threshold is 100 ppbv. For the vertically integrated data the minimum threshold is 0.1 ppmv/m and the maximum threshold is 30.0 ppmv/m.

Movie4.exe and three "dll" files are freeware from Lantern Corporation that can be used to view the animations, as can movie software available with Windows 95. To use this viewer, copy these files to the same directory as the "avi" files. From Windows Explorer, double click on Movie4. Click at the upper left of the window that opens and choose Options/Control/Remote. Drag the Remote window to a convenient place (e.g., the lower right corner of the screen). Click Open, and select the "avi" file to be viewed. The Remote can be used to view single frames, change the speed of the display, etc. It is possible to open a second Movie4 and display two animations side-by-side.

C.3.2 CALMET and UAM Input Data

C.3.2.1 CALMET Data

CALMET requires surface meteorological measurements, upper air meteorological measurements, and geophysical measurements.

C.3.2.1.1 Surface Data

CALMET requires hourly surface observations of wind speed and direction, temperature, cloud cover, ceiling heights, surface pressure, relative humidity, and optional precipitation type codes which are used only if wet removal is to be simulated. Most routine sites report only wind and temperature data. The NFRAQS data base (Chow et al., 1998) contains a large number of surface meteorological measurements from a variety of networks.

Eight National Weather Service (NWS) stations recorded wind, temperature, relative humidity, solar and net radiation. Some NWS stations also reported pressure, cloud cover and ceiling height data. Seven Remote Automated Weather Stations (RAWS) reported temperature, winds and relative humidity. Thirty-four stations from a variety of networks recorded in the Aerometric Information Retrieval System (AIRS) reported winds and temperature. Twelve Colorado Agricultural Meteorological Stations (COAGMET) reported temperature, winds and relative humidity. Surface meteorological measurements (winds, temperature and relative humidity) were also acquired from NFRAQS monitors collocated with NFRAQS upper air measurements. CALMET allows missing values, but at least one surface site should have a valid data for each hour. A screening program developed for NFRAQS takes the surface data from different networks and creates a single data file which can be directly used by the CALMET simulator.

C.3.2.1.2 Upper Air Data

CALMET uses wind speed, wind direction, temperature, and pressure measurements

at different elevations above ground level. At least one station provides these data with a minimum of two vertical measurements per day. Vertical pressure measurements, however, are not essential. Six NFRAQS radar profilers that measured wind speed and direction from 100 m agl to 2000 to 4000 m agl, depending on weather conditions. Radio-Acoustic-Sounding-Systems (RASS) measured virtual temperature from 100 m agl to ~800 m agl. Twice-daily soundings from the NWS site at Denver International Airport were also available. Doppler sodar systems at Welby reported high-resolution (10 m) wind data from about 50 to 200 m.

Vertical meteorological measurements are needed below the 100 m agl lower limit or the radar profilers. Surface measurements were merged with the upper air measurements in an integrated CALMET input data file. Where nearby surface measurements were lacking, radar profiler measurements were extrapolated to the surface with a power-law formula. Similarly, missing data at the top of the domain were filled with the closest available profiler measurements. RASS reports temperature data to about 800 m from the ground. Temperatures were extrapolated above 800 m agl by assuming a wet adiabatic lapse rate.

C.3.2.1.3 Geophysical Data

Geophysical data include terrain elevations, land uses, roughness length, Bowen ratio, soil heat flux, and leaf area index averaged over the 4 km x 4 km grid squares. Roughness lengths, Bowen ratios, soil heat fluxes, and leaf area indices are constants related to land use, obtained from the United States Geological Survey (USGS) Land Use and Land Cover digital data base (Watson et al., 1998). These data provide information on nine major land use classes, with 37 subclasses, and are available in Composite Theme Grid (CTG) format with a resolution of 200 meters (defined in local UTM coordinates).

The USGS 3-arc second Digital Elevation Models (DEM) are used for terrain elevations. Three-arc second DEMs yield a resolution of approximately 70 m in the east-west direction and 90 m in the north-south direction. Each terrain height is assigned to the appropriate grid cell, after converting the data locations to the grid coordinates, and an arithmetic average terrain height is calculated for each grid cell.

When no valid data were available in the NFRAQS data base at any site for a particular variable and hour, default values were assigned. These defaults are: 1) 273 °K for temperature; 2) 800 mb for pressure; 3) 99,000 ft for ceiling (unlimited); 4) zero for skycover; 5) 1 m/s for wind speed; and 6) 20% for relative humidity. The only variables for which the default values were needed were for skycover and ceiling height. For all other variables there was at least one site with the valid data.

Several inconsistencies between CALMET input data requirements and NFRAQS data were addressed by the following:

- NFRAQS profilers report only virtual temperature at upper levels. The difference between the surface air temperature and surface virtual temperature was added to the virtual temperature at upper levels to obtain absolute upper air temperatures.

- The following algorithm extended profiler wind measurements above their highest level to the top of the domain. ZTOP denotes the highest elevation reported by the radar profiler for a particular hour. MTOP denotes the top of the domain.
  - When ZTOP exceeded 1500 m agl, MTOP=ZTOP.
  - When ZTOP<500 m, measurements were invalidated for that site and hour and not used as CALMET input.
  - When ZTOP is between 500 m agl and 1500 m agl, the following procedure was followed:
    - When valid data were available within 12 hours from that hour, used temporal interpolation.
    - Else, used data at nearest profiler site with valid data. Each profiler site was assigned 3 sites to be used as the nearest sites in order of preference. The program searches for valid data in that order and uses the first one with the valid data.
    - When there were no valid data at any other profiler site, then the data for that hour were invalidated.
- The procedure to extend the temperature data to the top of the domain was:
  - When ZTOP was less that 500 m, the program first searched for valid data within 12 hours from that hour, and used temporal interpolation. If there were no valid data within 12 hours of the required hour, a search was done for valid data at the nearest profiler site. As was done for the wind data, each site was assigned 4 sites to search for valid data in a given order. If there were no valid data at any site, then the data for that hour were invalidated.
  - When valid data were found (i.e., either ZTOP was at least 500m, or data were obtained using temporal interpolation or using data from other sites), the data were extended to MTOP using wet adiabatic lapse rate.
  - The temperature data were then interpolated to the same levels for which wind data were available at that hour.

C.3.2.2 UAM Data

In addition to the output from CALMET, UAM-IV requires several additional input files.

C.3.2.2.1 SIMCONTROL Control File

The SIMCONTROL file controls the transport simulation. It assigns the start and end time for the simulation and assigns values for some flags and default values for certain variables. The TERRAIN flag was set to “FALSE” which means that the simulation does not require a gridded file specifying the surface roughness, and uses the default values for the surface roughness and the vegetation factor (used if surface uptake effects are calculated).

The flags for using the point source emissions and 2-dimensional temperature data were set to "TRUE". The surface removal flag was set to "TRUE" when deposition was included, otherwise it was set to "FALSE".

A default surface roughness value of 0.5 m, and a default vegetation factor of 0.3 were used. The maximum time slice was assigned a value of 0.1 hours. The chemistry integration control variables were assigned the recommended values (SAI, 1990) as chemistry effects were not included in the calculations. Print options were set to print the average and instantaneous concentration files and the print interval was set as one hour.

C.3.2.2.2 CHEMPARAM Chemical Variable File

CHEMPARAM defines the chemical species characteristics, reaction rates, and stoichiometric coefficients for the chemical mechanism used in the simulation. A CHEMPARAM file was prepared with all species treated as non-reacting. SO_2 emissions from different sources were tagged and included as different species in the CHEMPARAM file. An uptake resistance of 0.00555 hr/m was used for SO_2 to simulate the dry deposition. Separate simulations were run without including the effect of dry deposition. Table C.3-2 shows different species used in the CHEMPARAM file.

C.3.2.2.3 TOPCON, BNDARY, and ARAUL Initial and Boundary Conditions Files

Three files specify the initial and boundary conditions. The TOPCON file specifies concentrations at the top of the domain. The BNDARY file specifies concentrations at the four vertical boundary planes. The AIRQUL file specifies the initial concentrations for the whole domain. A constant value of 10^{-6} ppm was used for all species for all three files. The purpose of using a small value was to calculate the impact of emissions without any interference from the initial or boundary concentrations.

C.3.2.2.4 WIND, TEMPERATURE and DIFFBREAK Files

The WIND file specifies 3-dimensional wind fields. This file was directly prepared from the CALMET output file. All UAM-IV levels except the first level are coincident with the vertical levels used in the CALMET. Hence, the velocities at those levels were directly used from the CALMET output file. The velocities at the surface level of UAM-IV were calculated as weighted average of the first two levels used in CALMET.

The TEMPERATURE file specifies the two-dimensional surface temperatures used in the simulation. This file was also directly prepared from the CALMET output file using the first layer temperatures from that file. The DIFFBREAK file specifies the height of the diffusion break. The diffusion break as used in the UAM is the turbulent mixing depth during neutral/unstable conditions (mostly during the day) and the depth of the surface based inversion during stable conditions (mostly during the night). Correct specification of the depth of the nocturnal inversion layer is crucial to proper simulation of the evolution of the pollutant field. During the day-time, the mixing heights generated from CALMET were used to assign the diffusion break height. At night-time, the vertical temperature structure at

Welby or Brighton (if data at Welby were missing) was used to determine the height of the inversion layer and that height was then used as the diffusion break height for the whole domain. Height of the inversion base was defined as the maximum height from the surface at which the vertical temperature gradient was positive.

C.3.2.2.5 METSCALARS Meteorological Parameter File

The METSCALARS file specifies meteorological parameters that are treated by the UAM-IV as scalars. The most important parameters specified in the METSCALARS file are the temperature gradients above and below the DIFFBREAK height. These, in concert with exposure class, control the rate of vertical mixing, which is crucial during stable and stagnant nighttime conditions. The temperature gradients were obtained using the RASS data at the Welby and Brighton profiler sites. The exposure class was estimated based on hourly calculated solar elevation angles and by assuming a clear sky, as recommended in the UAM User's Guide. Exposure values of -2 represent zero solar energy and clear skies (heat loss via a radiation deficit), while values of 1 represent solar energy at low elevation angles (morning and evening) and clear skies (small heat gain via radiation surplus). Atmospheric pressure, water vapor, and NO_2 photolysis rate constants are not used to simulate transport of non-reacting pollutants, and these parameters were assigned default values in the METSCALARS file.

C.3.2.2.6 EMISSIONS and PTSOURCE Files

The UAM-IV uses two emissions input files. The EMISSIONS file contains ground-level emissions for the two-dimensional grid. The EMISSIONS file was developed using data obtained from CDPHE and included emissions from the area sources, wood combustion, mobile sources, and the low-level point sources. The emissions from the airports were suspect (the spatial pattern was not in agreement with the location of the airports), and hence were not included. The total emissions from the airports were negligible compared to other sources, so their exclusion from the emissions file should not cause any significant error in the results. The PTSOURCE file specifies hourly emissions from the elevated sources.

C.3.3 CALMET/UAM Simulation and Measurement Evaluation

C.3.3.1 CALMET/UAM Performance Measures

Four performance statistical measures were considered in gridded simulation evaluations. These measure are the mean bias, mean normalized bias, mean error, and mean normalized error. Statistics were calculated separately for each core site. The various statistical measures are defined as follows:

Mean bias (BIAS)

$$BIAS = \frac{1}{N}\sum_{i=1}^{N}(Est_{x,t}^{i} - Obs_{x,t}^{i}) \qquad \text{(C.3-1)}$$

where N includes all of the estimated (Est) and observed (Obs) concentration pairs with observed concentrations above the cutoff value at a station in a region on a given day. Note that the bias is defined as a positive quantity when the simulated estimate exceeds the observation. This statistical measure is used to make statements regarding the absolute or unnormalized bias in simulations.

Mean normalized bias (NBIAS in percent)

$$NBIAS = \frac{100}{N}\sum_{i=1}^{N}\frac{(Est^{i}_{x,t} - Obs^{i}_{x,t})}{Obs^{i}_{x,t}} \qquad \text{(C.3-2)}$$

Averaging over a large number of points can appear to hide discrepancies because positive and negative biases offset one another in the bias formula,. For this reason, information on the bias must be used in combination with information on the error (see below) which is calculated in a manner that does not allow positive and negative biases to offset one another.

Mean error (ERROR)

$$ERROR = \frac{1}{N}\sum_{i=1}^{N}|Est^{i}_{x,t} - OBS^{i}_{x,t}| \qquad \text{(C.3-3)}$$

Mean normalized error (NERROR in percent)

$$NERROR = \frac{100}{N}\sum_{i=1}^{N}\frac{|Est^{i}_{x,t} - OBS^{i}_{x,t}|}{Obs^{i}_{x,t}} \qquad \text{(C.3-4)}$$

Table C.3-3 shows these statistical measures of sulfur dioxide for the gridded simulations during the 01/12/97 to 01/20/97 episode. The gridded simulations slightly underestimate sulfur dioxide at Brighton, slightly overestimate sulfur dioxide at Evans, and greatly overestimate sulfur dioxide at Welby. The mean normalized bias and the mean normalized error are large because at times the observed concentrations are too small compared to the estimated concentrations. At Welby, the estimated concentrations are higher by a factor of 2 to 100 on average as compared to the observed concentrations. This was also evident from the time-series plots showing that the estimated sulfur concentrations at Welby were in 100's of ppbv due to emissions from the Cherokee power plant even when the observed concentrations were only in 1's of ppbv. This may be due to the simple approach for vertical mixing used in UAM-IV which uses one temperature gradient value (varying hourly) as the main criterion for controlling mixing during the day-time. Thus, it is possible that vertical mixing in these simulations is not characterized well.

Table C.3-4 shows the performance statistics for the 01/27/97 to 01/30/97 episode. The performance is similar to the 01/12/97 to 01/20/97 episode, though mean normalized error and mean normalized bias values are higher at Brighton, and lower at Welby for the 01/27/97 to 01/30/97 episode. Overall, the results indicate that the estimated sulfur dioxide

concentrations are within a factor of 2 of the observed concentrations on most days at Brighton and Evans. At Welby, the concentrations are overestimated by a factor of 2 to 10.

Tables C.3-5 through C.3-12 summarize the cumulative frequency distributions of the SO_2 concentrations calculated by the gridded transport simulations. Tables C.3-13 through C.3-16 summarize the cumulative frequency distributions of the SO_2 concentrations calculated by the gridded transport simulations and by the puff transport simulations, and compares these results with those from the gridded transport simulations and with monitoring data. These provide greater detail than the illustrative examples presented by Watson et al. (1998).

Table C.3-1
CALMET Simulation Options, Sensitivity Tests, and Optimal Values

Parameter	Default	NFRAQS Optimal
GRID PARAMETERS		
Grid Resolution (km)		
Mesoscale Region	None	4
Grid Projection Type		
Universal Transverse Mercator (UTM) or Lambert Conformal Mapping (LCM)	UTM	UTM
Model Domain Extent (km x km)		
Mesoscale Region	None	312 x 220
Top of Modeling Domain (km AGL)		
Mesoscale Region	None	2.8
Number of Vertical Layers		
Mesoscale Region	None	26
DIAGNOSTIC WIND MODEL (DWM) PARAMETERS		
Model Type (0=objective analysis/1=DWM)	1	1
Compute Froude Number Adjustment (0=No/1=Yes)	1	1
Compute Kinematic Effects (0=No/1=Yes)	1	1
Use O'Brien Procedure to Adjust Vertical Velocity	1	0
Extrapolate Surface Wind Observations to Upper Layers (1=no extrapolation, 2=power law extrapolation, 3=user input multiplicative factors, 4=similarity theory used) (negative value=ignore layer 1 data at upper-air sites)	1	1
Minimum surface-upper site distance allowing vert extrapolation (km)	4	4
Use Gridded Prognostic Model Output	No	No
Kinematic Effect Parameters		
Empirical factor Controlling Kinematic Effects (Alpha)	0.1	0.1

Table C.3-1 (continued)
CALMET Simulation Options, Sensitivity Tests, and Optimal Values

Parameter	Default	NFRAQS Optimal
Radius of Influence Parameters		
Use Varying Radius of Influence (True/False)	False	True
Maximum Radius of Influence Surface Over Land (km)	None	100
Maximum Radius of Influence Aloft Over Land (km)	None	500
Maximum Radius of Influence Surface Over Water (km)	None	500
Minimum Radius of Influence in Wind Field Interpolation (km)	None	2.0
Blocking Effect Parameters		
Critical Froude Number (CRITFR)	1.0	1.0
Radius of Influence of Terrain Features (TERRAD) (km)	None	20
Distance Where First Guess Wind Field and Observations are Treated Equally		
Surface Wind Fields (R1) (km)	None	80
Aloft Wind Fields (R2) (km)	None	120
Divergence Minimization Procedure		
Maximum Acceptable Divergence	5.E-6	5.E-6
Maximum Number of Iterations	50	50
Number of smoothing passes	2 (sfc)/ 4 (aloft)	4 (all layers)
Maximum number of stations to use in interpolation	None	4 (all layers)
Number of Barriers in Wind Interpolation	0	1
Surface Temperature Control for DWM (0=compute internally/1=read from file DIAG.DAT)	0	0
Surface Site for DWM Temperature	None	Brighton
Domain Average Lapse Rate Control for DWM (0=compute internally/1=read from file DIAG.DAT)	0	0
Upper-air Station to use for Domain Average Lapse Rate	None	Brighton
Depth Domain Average Lapse Rate is computed (m AGL)	200	200
Domain Average wind components (0=calculate internally/1=read from file DIAG.DAT)	0	1
Bottom and Top of Layer for Domain Average Wind (m AGL)	1-2000	1-2000
Include Lake Breeze Effects	False	False

Table C.3-1 (continued)
CALMET Simulation Options, Sensitivity Tests, and Optimal Values

Parameter	Default	NFRAQS Optimal
MIXING HEIGHT, TEMPERATURE, AND PRECIPITATION PARAMETERS		
Neutral Mechanical Mixing Height Constant (B in Eqn. 2-54)	1.41	1.41
Convective Mixing Height Constant (E in Eqn. 2-52)	0.15	0.15
Stable Mixing Height Constant (B_2 in Eqn. 2-57)	2400	2400
Overwater Mixing Height Constant (c_w in Eqn. 2-64)	0.16	0.16
Coriolis Parameter (f in Eqn. 2-64) (l/s)	1.E-4	1.E-4
Minimum Temperature Lapse Rate Above Mixing Height (K/m)	0.001	0.001
Depth of Layer Above Convective Mixing Height for Lapse Rate Computation (m)	200	200
Maximum Overland Mixing Height (m)	2500	2500
Minimum Overland Mixing Height (m)	50	50
Maximum Overwater Mixing Height (m)	2500	2500
Minimum Overwater Mixing Height (m)	50	50
Conduct Spatial Averaging of Mixing Heights (0=No/1=Yes)	1	1
Maximum Search Distance for Spatial Averaging (grid cells)	1	3
Half-Angle of upwind-looking Cone for Spatial Averaging (deg.)	30	30
Layer of Winds Used in Upwind Averaging of Mixing Heights	None	4
Type of Temperature Interpolation ($1=1/r;2=l/r^2$)	1	1
Conduct Spatial Averaging of Temperatures (0=No/1=Yes)	1	1
Radius of Influence for Temperature Interpolation (grid cells)	20	20
Default Lapse Rate Overwater Below Mixing Height (K/m)	-0.0098	-0.0098
Default Lapse Rate Overwater Above Mixing Height (K/m)	-0.0045	-0.0045

Table C.3-2
Description of the Species used in UAM-IV Simulations

Species	Description
SO21	SO_2 emitted from Arapahoe power plant
NOX1	NO_x emitted from all elevated sources
SO22	SO_2 emitted from Cherokee power plant
SO23	SO_2 emitted from Pawnee power plant
SO24	SO_2 emitted from Valmont power plant
SO25	SO_2 emitted from Rawhide power plant
SO26	SO_2 emitted from Trigen power plant
SO27	SO_2 emitted from Conoco and Diamond Shamrock refineries
SO28	SO_2 emitted from rest of the elevated sources
SO2A	SO_2 emitted from the ground-level sources
NOXA	NO_x emitted from the ground-level sources

Table C.3-3
Sulfur Dioxide Performance Statistics using UAM-IV
with and without Deposition for the 01/12/97 to 01/20/97 Episode

Site	Day	Mean Bias (ppbv)		Mean Error (ppbv)		Mean Normalized Bias (percent)		Mean Normalized Error (percent)	
		No Deposition	With Deposition	No Deposition	With Deposition	No Deposition	With Deposition	No Deposition	With Deposition
Brighton	12-Jan	-0.1	-0.3	0.1	0.3	-27	-50	30	51
	13-Jan	1.3	-1.1	4.9	5.7	150	88	178	162
	14-Jan	-5.0	-10.0	14.5	11.1	1	-61	105	72
	15-Jan	-2.8	-4.1	2.8	4.1	-69	-80	69	80
	16-Jan	-0.4	-0.7	0.7	0.7	-35	-62	62	62
	17-Jan	7.9	-2.1	8.9	3.2	113	-17	125	40
	18-Jan	-3.1	-4.6	4.2	4.6	-52	-77	77	77
	19-Jan	6.8	1.8	6.9	2.6	269	84	271	106
	20-Jan	0.4	-2.3	3.0	2.7	29	-29	68	47
Evans	12-Jan	0.1	0.0	0.2	0.2	66	17	97	78
	13-Jan	0.5	-0.1	0.7	0.3	142	9	160	46
	14-Jan	0.6	-0.5	1.1	0.8	148	-14	177	75
	15-Jan	-1.1	-1.4	1.3	1.4	-45	-69	71	69
	16-Jan	-0.8	-0.9	0.8	0.9	-73	-82	73	82
	17-Jan	3.7	0.4	3.7	0.8	290	39	290	69
	18-Jan	1.2	-1.2	4.1	2.0	225	-27	331	100
	19-Jan	-0.1	-0.9	1.5	1.1	136	-17	184	43
	20-Jan	-1.1	-1.7	1.4	1.7	-20	-64	45	64
Welby	12-Jan	19.0	16.2	19.0	16.2	9504	8166	9504	8166
	13-Jan	40.6	31.8	40.6	32.1	5722	4509	5722	4514
	14-Jan	22.9	14.1	27.8	20.7	999	771	1008	792
	15-Jan	9.2	7.3	9.5	8.5	2301	1935	2317	1965
	16-Jan	25.8	20.9	25.8	20.9	2430	1913	2430	1913
	17-Jan	39.9	29.1	40.0	29.9	1076	760	1078	773
	18-Jan	0.9	-0.2	6.0	5.6	289	219	327	264
	19-Jan	8.8	7.1	10.1	8.5	3612	3394	3618	3400
	20-Jan	4.4	2.6	8.6	7.4	504	386	515	402

Table C.3-4
Sulfur Dioxide Performance Statistics using UAM-IV
with and without Deposition for the 01/27/97 to 01/30/97 Episode

Site	Day	Mean Bias (ppbv)		Mean Error (ppbv)		Mean Normalized Bias (percent)		Mean Normalized Error (percent)	
		No Deposition	With Deposition	No Deposition	With Deposition	No Deposition	With Deposition	No Deposition	With Deposition
Brighton	27-Jan	0.0	-0.1	0.2	0.2	14	-21	64	48
	28-Jan	5.9	-0.8	9.8	3.8	332	55	359	106
	29-Jan	1.3	0.4	1.6	0.8	343	133	382	203
	30-Jan	2.9	0.7	3.5	2.0	1469	618	1492	654
Evans	27-Jan	-0.8	-0.8	0.8	0.8	-63	-72	66	72
	28-Jan	0.9	-0.4	1.5	0.9	39	-38	90	63
	29-Jan	-0.8	-1.0	1.0	1.1	-58	-76	75	82
	30-Jan	0.6	-1.3	2.9	1.6	97	-56	208	84
Welby	27-Jan	28.0	22.4	28.0	22.4	2353	1717	2353	1717
	28-Jan	10.6	5.9	14.6	10.6	418	245	441	278
	29-Jan	13.6	10.0	13.9	11.0	2848	2166	2851	2174
	30-Jan	-0.7	-1.4	3.9	3.8	2163	1859	2186	1889

Table C.3-5
Cumulative Frequency Distributions of SO_2 Concentrations at CAMP during 01/12/97 to 01/21/97
Calculated by the Gridded Transport Simulations with and without Dry Deposition

	SO2 Concentations (ppbv)			SO2 Concentations (ppbv)			SO2 Concentations (ppbv		
	No Dry Deposition	With Dry Deposition	Concent-ration Ratios	No Dry Deposition	With Dry Deposition	Concent-ration Ratios	No Dry Deposition	With Dry Deposition	Concent-ration Ratios
	Surface Sources			**Trigen**			**Rawhide**		
max	28.5	18.0	0.632	3.06	1.72	0.563	0.006	0.000	0.018
5%	18.9	10.2	0.539	2.28	1.07	0.469	0.000		
10%	11.3	7.27	0.641	0.91	0.58	0.640			
20%	6.98	4.47	0.641	0.389	0.260	0.669			
30%	5.14	3.44	0.670	0.182	0.121	0.664			
40%	3.79	2.58	0.680	0.095	0.026	0.272			
50%	2.63	1.72	0.651	0.021	0.008	0.380			
60%	1.74	1.12	0.641	0.006	0.002	0.304			
Avg	4.61	2.89	0.626	0.31	0.16	0.527	0.000		
	Cherokee			**Pawnee**			**Total SO2 Predicted**		
max	42.3	24.7	0.583	0.27	0.18	0.680	54.2	31.7	0.585
5%	15.9	10.9	0.686	0.20	0.068	0.344	31.2	20.0	0.641
10%	11.1	6.02	0.542	0.15	0.049	0.320	28.2	15.8	0.563
20%	3.99	1.64	0.410	0.091	0.024	0.264	16.0	8.93	0.558
30%	0.52	0.16	0.313	0.061	0.013	0.216	10.5	6.11	0.584
40%	0.18	0.045	0.247	0.014	0.001	0.050	6.70	4.20	0.627
50%	0.046	0.019	0.413	0.001	0.000		4.31	2.94	0.683
60%	0.006	0.002	0.383	0.000			3.34	2.02	0.606
Avg	2.69	1.59	0.590	0.042	0.014	0.342	9.10	5.51	0.605
	Arapahoe			**Valmont**					
max	10.4	4.52	0.435	1.38	0.84	0.610			
5%	4.30	2.70	0.627	1.04	0.34	0.325			
10%	2.80	2.15	0.768	0.39	0.09	0.219			
20%	1.38	0.91	0.658	0.076	0.013	0.173			
30%	0.48	0.25	0.513	0.012	0.003	0.270			
40%	0.18	0.084	0.454	0.003	0.001	0.393			
50%	0.080	0.029	0.359	0.000					
60%	0.017	0.003	0.198						
Avg	0.81	0.52	0.634	0.11	0.043	0.380			
	Refineries			**Other Point Sources**					
max	6.85	4.90	0.715	0.213	0.141	0.665			
5%	2.30	1.19	0.516	0.125	0.050	0.401			
10%	1.99	0.92	0.463	0.079	0.036	0.452			
20%	0.73	0.37	0.516	0.024	0.013	0.527			
30%	0.31	0.15	0.485	0.013	0.004	0.298			
40%	0.037	0.018	0.491	0.004	0.001	0.214			
50%	0.010	0.002	0.165	0.001	0.000				
60%	0.003	0.000		0.000					
Avg	0.50	0.29	0.574	0.020	0.009	0.477			

Table C.3-6
Cumulative Frequency Distributions of SO_2 Concentrations at Welby during 01/12/97 to 01/21/97
Calculated by the Gridded Transport Simulations with and without Dry Deposition

	SO2 Concentations (ppbv)			SO2 Concentations (ppbv)			SO2 Concentations (ppbv)		
	No Dry Deposition	With Dry Deposition	Concent-ration Ratios	No Dry Deposition	With Dry Deposition	Concent-ration Ratios	No Dry Deposition	With Dry Deposition	Concent-ration Ratios
	Cherokee			**Trigen**			**Rawhide**		
max	126.1	106.0	0.841	2.46	1.52	0.618	0.006	0.000	0.033
5%	69.8	63.2	0.906	1.59	0.88	0.557	0.000		
10%	40.9	37.5	0.917	1.01	0.70	0.686			
20%	19.5	16.2	0.835	0.661	0.40	0.601			
30%	11.2	10.3	0.917	0.270	0.138	0.513			
40%	4.56	2.04	0.447	0.151	0.045	0.296			
50%	0.741	0.354	0.477	0.069	0.023	0.332			
60%	0.243	0.075	0.310	0.020	0.009	0.472			
Avg	12.2	10.3	0.847	0.33	0.192	0.582	0.000		
	Surface Sources			**Valmont**			**Total SO2 Predicted**		
max	34.2	27.4	0.802	3.20	2.34	0.731	140.2	116.1	0.828
5%	23.6	19.6	0.828	1.44	0.62	0.432	83.3	69.2	0.831
10%	20.5	15.4	0.751	0.49	0.226	0.460	54.8	48.3	0.880
20%	14.0	10.6	0.758	0.154	0.060	0.387	30.0	25.1	0.836
30%	9.55	6.90	0.723	0.046	0.013	0.276	23.8	17.6	0.740
40%	7.63	5.52	0.723	0.011	0.005	0.426	19.1	14.4	0.750
50%	5.83	4.05	0.695	0.003	0.001	0.286	15.0	12.0	0.796
60%	4.35	3.10	0.712	0.000			10.7	7.70	0.720
Avg	8.25	6.18	0.748	0.211	0.098	0.462	22.5	17.8	0.792
	Refineries			**Pawnee**					
max	7.72	6.34	0.822	0.21	0.10	0.470			
5%	4.98	3.75	0.753	0.18	0.080	0.448			
10%	2.43	2.01	0.829	0.14	0.051	0.368			
20%	1.77	1.34	0.756	0.08	0.029	0.360			
30%	1.27	1.03	0.810	0.04	0.011	0.250			
40%	0.92	0.65	0.706	0.017	0.001	0.048			
50%	0.28	0.16	0.568	0.001	0.000				
60%	0.068	0.036	0.535	0.000					
Avg	1.01	0.76	0.755	0.037	0.013	0.354			
	Arapahoe			**Other Point Sources**					
max	7.32	6.03	0.824	0.304	0.203	0.667			
5%	2.46	1.37	0.556	0.161	0.119	0.738			
10%	1.36	0.94	0.692	0.125	0.090	0.719			
20%	0.513	0.301	0.588	0.061	0.040	0.662			
30%	0.199	0.111	0.560	0.035	0.017	0.490			
40%	0.066	0.030	0.458	0.010	0.004	0.400			
50%	0.021	0.008	0.385	0.004	0.001	0.273			
60%	0.007	0.001	0.176	0.001	0.000				
Avg	0.47	0.27	0.586	0.036	0.022	0.624			

Table C.3-7
Cumulative Frequency Distributions of SO_2 Concentrations at Brighton during 01/12/97 to 01/21/97
Calculated by the Gridded Transport Simulations with and without Dry Deposition

	SO2 Concentations (ppbv)			SO2 Concentations (ppbv)			SO2 Concentations (ppbv)		
	No Dry Deposition	With Dry Deposition	Concent-ration Ratios	No Dry Depositio n	With Dry Deposition	Concent-ration Ratios	No Dry Depositio n	With Dry Deposition	Concent-ration Ratios
	Surface Sources			**Valmont**			**Rawhide**		
max	33.05	8.71	0.263	6.33	1.94	0.306	0.013	0.009	0.692
5%	15.66	5.47	0.349	1.63	1.05	0.646	0.002	0.001	0.250
10%	9.38	3.09	0.330	1.06	0.74	0.699	0.000	0.000	
20%	4.08	1.90	0.467	0.424	0.261	0.616			
30%	1.82	0.89	0.490	0.248	0.154	0.622			
40%	0.98	0.56	0.573	0.086	0.057	0.663			
50%	0.73	0.42	0.573	0.013	0.007	0.511			
60%	0.50	0.30	0.587	0.005	0.000	0.085			
Avg	2.97	1.10	0.369	0.34	0.18	0.547	0.000	0.000	
	Cherokee			**Trigen**			**Total SO2 Predicted**		
max	28.12	15.54	0.552	1.89	0.79	0.419	56.98	18.69	0.328
5%	8.49	4.79	0.564	0.59	0.28	0.469	26.18	9.79	0.374
10%	5.00	2.36	0.472	0.34	0.17	0.513	14.79	7.38	0.499
20%	1.81	0.87	0.478	0.16	0.068	0.436	9.01	4.04	0.449
30%	0.69	0.44	0.642	0.065	0.028	0.427	5.97	3.04	0.510
40%	0.16	0.074	0.462	0.029	0.010	0.346	4.01	1.96	0.487
50%	0.022	0.011	0.502	0.006	0.002	0.379	1.62	1.07	0.662
60%	0.009	0.004	0.420	0.001	0.000		0.98	0.55	0.563
Avg	1.53	0.79	0.513	0.12	0.053	0.444	5.74	2.52	0.439
	Refineries			**Pawnee**					
max	5.90	2.05	0.348	0.50	0.25	0.501			
5%	2.43	1.21	0.501	0.35	0.14	0.401			
10%	1.50	0.78	0.517	0.15	0.062	0.411			
20%	0.64	0.40	0.629	0.06	0.02	0.338			
30%	0.31	0.19	0.623	0.03	0.009	0.268			
40%	0.12	0.077	0.663	0.015	0.002	0.158			
50%	0.035	0.023	0.647	0.001	0.000				
60%	0.008	0.004	0.461	0.000					
Avg	0.45	0.22	0.499	0.051	0.020	0.397			
	Arapahoe			**Other Point Sources**					
max	3.83	2.39	0.624	0.461	0.193	0.418			
5%	1.68	0.88	0.522	0.187	0.124	0.664			
10%	0.79	0.53	0.672	0.138	0.085	0.615			
20%	0.18	0.093	0.515	0.067	0.043	0.645			
30%	0.054	0.021	0.378	0.052	0.028	0.532			
40%	0.018	0.011	0.583	0.030	0.019	0.625			
50%	0.004	0.001	0.237	0.015	0.010	0.632			
60%	0.001	0.000		0.008	0.006	0.675			
Avg	0.23	0.13	0.562	0.046	0.027	0.582			

Table C.3-8
Cumulative Frequency Distributions of SO_2 Concentrations at Evans during 01/12/97 to 01/21/97
Calculated by the Gridded Transport Simulations with and without Dry Deposition

	SO2 Concentations (ppbv)			SO2 Concentations (ppbv)			SO2 Concentations (ppbv)		
	No Dry Deposition	With Dry Deposition	Concent-ration Ratios	No Dry Depositio n	With Dry Deposition	Concent-ration Ratios	No Dry Depositio n	With Dry Deposition	Concent-ration Ratios
	Cherokee			**Refineries**			**Rawhide**		
max	6.94	2.18	0.315	0.81	0.364	0.450	0.084	0.055	0.655
5%	4.07	1.45	0.356	0.56	0.252	0.451	0.027	0.015	0.561
10%	2.75	1.14	0.414	0.39	0.171	0.435	0.012	0.002	0.154
20%	0.84	0.28	0.329	0.103	0.029	0.284	0.000	0.000	
30%	0.098	0.031	0.317	0.005	0.002	0.283	0.000		
40%	0.042	0.013	0.315	0.003	0.000				
50%	0.008	0.002	0.247	0.000					
60%	0.002	0.000							
Avg	0.69	0.24	0.344	0.089	0.034	0.384	0.004	0.001	0.328
	Surface Sources			**Trigen**			**Total SO2 Predicted**		
max	2.86	1.88	0.657	0.55	0.40	0.727	11.44	3.48	0.304
5%	1.60	0.75	0.470	0.40	0.10	0.248	7.80	2.53	0.324
10%	1.37	0.50	0.363	0.21	0.087	0.410	5.52	2.25	0.407
20%	1.13	0.39	0.346	0.045	0.016	0.364	3.13	1.09	0.349
30%	0.95	0.31	0.330	0.007	0.002	0.235	1.64	0.69	0.420
40%	0.67	0.24	0.361	0.003	0.000	0.032	1.27	0.48	0.378
50%	0.50	0.16	0.328	0.001	0.000		0.97	0.38	0.394
60%	0.316	0.117	0.370	0.000			0.66	0.29	0.441
Avg	0.64	0.25	0.382	0.054	0.018	0.342	1.91	0.69	0.361
	Valmont			**Other Point Sources**					
max	3.36	1.04	0.310	0.65	0.31	0.478			
5%	1.02	0.41	0.403	0.39	0.080	0.205			
10%	0.80	0.26	0.323	0.10	0.035	0.349			
20%	0.30	0.092	0.305	0.056	0.023	0.416			
30%	0.17	0.065	0.384	0.038	0.014	0.365			
40%	0.12	0.032	0.273	0.024	0.007	0.302			
50%	0.026	0.005	0.212	0.013	0.003	0.252			
60%	0.003	0.000		0.005	0.002	0.320			
Avg	0.22	0.08	0.337	0.051	0.020	0.388			
	Arapahoe			**Pawnee**					
max	1.79	0.75	0.421	0.276	0.247	0.896			
5%	1.03	0.45	0.442	0.093	0.053	0.570			
10%	0.56	0.12	0.221	0.071	0.025	0.348			
20%	0.051	0.013	0.255	0.048	0.009	0.185			
30%	0.013	0.002	0.182	0.022	0.005	0.237			
40%	0.002	0.000		0.008	0.001	0.115			
50%	0.000			0.001	0.000				
60%				0.000					
Avg	0.13	0.048	0.371	0.023	0.009	0.399			

Table C.3-9
Cumulative Frequency Distributions of SO_2 Concentrations at CAMP during 01/27/97 to 01/31/97
Calculated by the Gridded Transport Simulations with and without Dry Deposition

	SO2 Concentations (ppbv)			SO2 Concentations (ppbv)			SO2 Concentations (ppbv)		
	No Dry Deposition	With Dry Deposition	Concent-ration Ratios	No Dry Depositio n	With Dry Deposition	Concent-ration Ratios	No Dry Depositio n	With Dry Deposition	Concent-ration Ratios
	Surface Sources			**Trigen**			**Rawhide**		
max	21.3	10.1	0.473	0.99	0.70	0.705	0.000	0.000	
5%	13.7	7.5	0.552	0.72	0.48	0.661			
10%	8.6	6.1	0.710	0.45	0.26	0.572			
20%	6.17	3.61	0.586	0.256	0.152	0.592			
30%	3.80	2.64	0.694	0.176	0.088	0.501			
40%	2.35	1.51	0.642	0.082	0.057	0.697			
50%	1.71	1.03	0.600	0.036	0.022	0.613			
60%	1.16	0.79	0.683	0.008	0.001	0.122			
Avg	3.37	2.09	0.618	0.14	0.089	0.625			
	Cherokee			**Valmont**			**Total SO2 Predicted**		
max	11.6	7.5	0.649	0.60	0.17	0.284	27.7	19.0	0.687
5%	8.8	4.2	0.482	0.15	0.12	0.763	23.8	12.5	0.525
10%	4.7	2.64	0.562	0.11	0.064	0.554	18.8	9.8	0.520
20%	1.74	1.08	0.623	0.018	0.003	0.175	11.0	7.5	0.686
30%	0.86	0.45	0.526	0.007	0.000		8.3	4.6	0.551
40%	0.26	0.065	0.251	0.000			4.9	3.04	0.619
50%	0.009	0.003	0.391				2.99	1.88	0.628
60%	0.001	0.000					2.03	1.24	0.609
Avg	1.24	0.70	0.565	0.028	0.013	0.475	6.3	3.8	0.601
	Arapahoe			**Other Point Sources**					
max	14.58	11.94	0.819	0.217	0.10	0.462			
5%	7.61	4.72	0.620	0.141	0.066	0.464			
10%	4.67	1.47	0.314	0.097	0.049	0.511			
20%	1.30	0.72	0.556	0.032	0.017	0.530			
30%	0.30	0.18	0.597	0.014	0.008	0.531			
40%	0.14	0.088	0.621	0.006	0.001	0.218			
50%	0.045	0.023	0.497	0.002	0.000				
60%	0.001	0.001	0.455	0.000					
Avg	1.14	0.69	0.606	0.023	0.011	0.472			
	Refineries			**Pawnee**					
max	2.29	1.20	0.524	0.001	0.000	0.000			
5%	1.59	1.07	0.674	0.001					
10%	1.34	0.69	0.516	0.000					
20%	0.59	0.36	0.616						
30%	0.27	0.16	0.588						
40%	0.13	0.047	0.367						
50%	0.032	0.002	0.076						
60%	0.001	0.000							
Avg	0.32	0.18	0.563	0.000					

Table C.3-10
Cumulative Frequency Distributions of SO_2 Concentrations at Welby during 01/27/97 to 01/31/97
Calculated by the Gridded Transport Simulations with and without Dry Deposition

	SO2 Concentations (ppbv)			SO2 Concentations (ppbv)			SO2 Concentations (ppbv)		
	No Dry Deposition	With Dry Deposition	Concent-ration Ratios	No Dry Deposition	With Dry Deposition	Concent-ration Ratios	No Dry Deposition	With Dry Deposition	Concent-ration Ratios
	Cherokee			**Trigen**			**Rawhide**		
max	65.2	58.5	0.897	0.86	0.59	0.682	0.000	0.000	
5%	31.2	27.7	0.886	0.71	0.46	0.655			
10%	18.4	15.4	0.839	0.60	0.34	0.566			
20%	9.09	7.40	0.814	0.287	0.140	0.486			
30%	6.02	4.97	0.826	0.123	0.078	0.637			
40%	3.96	2.19	0.554	0.086	0.049	0.565			
50%	1.25	0.47	0.377	0.026	0.012	0.455			
60%	0.19	0.07	0.386	0.010	0.002	0.173			
Avg	6.46	5.35	0.829	0.15	0.088	0.597			
	Surface Sources			**Valmont**			**Total SO2 Predicted**		
max	32.3	22.8	0.705	0.45	0.42	0.919	79.5	68.1	0.856
5%	19.4	14.6	0.756	0.17	0.12	0.706	43.4	36.0	0.829
10%	13.0	9.86	0.757	0.13	0.064	0.503	32.1	26.1	0.812
20%	9.68	7.48	0.773	0.061	0.014	0.222	21.8	17.1	0.785
30%	7.69	5.41	0.703	0.010	0.004	0.347	14.6	10.3	0.704
40%	5.62	3.83	0.680	0.006	0.000		11.5	8.33	0.726
50%	4.00	2.78	0.695	0.000			9.90	6.85	0.692
60%	2.63	2.04	0.776				7.72	6.05	0.784
Avg	5.78	4.37	0.756	0.033	0.019	0.567	13.8	10.7	0.775
	Refineries			**Other Point Sources**					
max	5.99	4.78	0.799	0.22	0.14	0.644			
5%	3.27	2.64	0.808	0.12	0.08	0.702			
10%	2.03	1.62	0.801	0.09	0.06	0.637			
20%	1.48	1.17	0.793	0.07	0.03	0.458			
30%	0.69	0.53	0.771	0.03	0.013	0.512			
40%	0.35	0.16	0.448	0.014	0.007	0.504			
50%	0.10	0.023	0.235	0.005	0.000				
60%	0.021	0.006	0.296	0.000					
Avg	0.69	0.52	0.755	0.028	0.016	0.576			
	Arapahoe			**Pawnee**					
max	6.35	5.11	0.805	0.002	0.000	0.188			
5%	4.74	2.29	0.483	0.001					
10%	2.09	1.13	0.541	0.000					
20%	1.05	0.52	0.498						
30%	0.54	0.19	0.354						
40%	0.22	0.08	0.353						
50%	0.009	0.008	0.798						
60%	0.000	0.000							
Avg	0.69	0.35	0.512	0.000					

Table C.3-11
Cumulative Frequency Distributions of SO_2 Concentrations at Brighton during 01/27/97 to 01/31/97
Calculated by the Gridded Transport Simulations with and without Dry Deposition

	SO2 Concentations (ppbv)			SO2 Concentations (ppbv)			SO2 Concentations (ppbv)		
	No Dry Deposition	With Dry Deposition	Concent-ration Ratios	No Dry Deposition	With Dry Deposition	Concent-ration Ratios	No Dry Deposition	With Dry Deposition	Concent-ration Ratios
	Surface Sources			**Valmont**			**Rawhide**		
max	24.9	6.97	0.280	2.15	1.44	0.667	0.000	0.000	
5%	13.8	4.49	0.325	0.32	0.15	0.470			
10%	7.64	2.80	0.367	0.05	0.04	0.698			
20%	3.42	1.34	0.392	0.037	0.004	0.094			
30%	0.95	0.61	0.642	0.019	0.001	0.049			
40%	0.63	0.39	0.622	0.004	0.000				
50%	0.44	0.27	0.621	0.000					
60%	0.30	0.18	0.580						
Avg	2.41	0.91	0.376	0.066	0.036	0.553			
	Cherokee			**Other Point Sources**			**Total SO2 Predicted**		
max	8.77	5.26	0.600	0.25	0.17	0.672	40.7	10.0	0.246
5%	6.13	3.63	0.593	0.20	0.13	0.661	22.9	7.07	0.309
10%	3.71	1.55	0.417	0.12	0.080	0.657	10.5	5.21	0.495
20%	1.30	0.61	0.468	0.064	0.042	0.645	6.99	3.63	0.519
30%	0.49	0.15	0.305	0.023	0.016	0.697	3.48	2.22	0.638
40%	0.092	0.054	0.588	0.016	0.007	0.454	1.82	1.14	0.626
50%	0.021	0.002	0.108	0.010	0.004	0.396	0.82	0.48	0.590
60%	0.002	0.000		0.006	0.002	0.362	0.47	0.25	0.546
Avg	0.88	0.44	0.502	0.036	0.022	0.621	4.13	1.74	0.421
	Refineries			**Trigen**					
max	3.22	1.34	0.417	0.41	0.28	0.689			
5%	2.30	1.10	0.476	0.27	0.18	0.646			
10%	1.74	0.90	0.519	0.14	0.044	0.319			
20%	0.70	0.49	0.695	0.02	0.01	0.341			
30%	0.26	0.20	0.780	0.01	0.001	0.133			
40%	0.075	0.042	0.561	0.004	0.000				
50%	0.011	0.007	0.609	0.002					
60%	0.002	0.001	0.304	0.000					
Avg	0.41	0.22	0.539	0.034	0.016	0.458			
	Arapahoe			**Pawnee**					
max	5.31	0.88	0.165	0.001	0.000				
5%	1.68	0.67	0.397	0.000					
10%	0.92	0.38	0.417						
20%	0.33	0.14	0.441						
30%	0.13	0.07	0.508						
40%	0.02	0.01	0.498						
50%	0.001	0.000							
60%	0.000								
Avg	0.30	0.10	0.340	0.000					

Table C.3-12
Cumulative Frequency Distributions of SO_2 Concentrations at Evans during 01/27/97 to 01/31/97
Calculated by the Gridded Transport Simulations with and without Dry Deposition

	SO2 Concentations (ppbv)			SO2 Concentations (ppbv)			SO2 Concentations (ppbv)		
	No Dry Deposition	With Dry Deposition	Concent-ration Ratios	No Dry Deposition	With Dry Deposition	Concent-ration Ratios	No Dry Deposition	With Dry Deposition	Concent-ration Ratios
	Surface Sources			**Valmont**			**Pawnee**		
max	3.55	2.02	0.571	0.76	0.18	0.240	0.000	0.000	
5%	2.87	0.62	0.215	0.33	0.13	0.400			
10%	1.48	0.51	0.342	0.23	0.02	0.104			
20%	0.84	0.35	0.416	0.11	0.018	0.158			
30%	0.51	0.20	0.392	0.036	0.008	0.229			
40%	0.30	0.14	0.457	0.010	0.001	0.049			
50%	0.22	0.093	0.428	0.001	0.000				
60%	0.15	0.075	0.510	0.000					
Avg	0.53	0.19	0.366	0.063	0.014	0.227			
	Cherokee			**Trigen**			**Total SO2 Predicted**		
max	2.89	1.90	0.656	0.42	0.12	0.283	8.19	3.42	0.418
5%	2.59	1.14	0.442	0.21	0.078	0.380	6.56	2.64	0.403
10%	2.30	0.68	0.294	0.15	0.046	0.307	5.62	1.53	0.273
20%	0.45	0.14	0.305	0.066	0.016	0.248	1.60	0.70	0.439
30%	0.036	0.008	0.233	0.002	0.000	0.167	0.72	0.29	0.404
40%	0.001	0.000		0.000			0.50	0.19	0.378
50%	0.000						0.28	0.12	0.433
60%							0.19	0.089	0.479
Avg	0.40	0.16	0.393	0.037	0.011	0.289	1.25	0.46	0.372
	Arapahoe			**Other Point Sources**					
max	1.57	0.98	0.627	0.12	0.040	0.337			
5%	0.66	0.37	0.559	0.081	0.021	0.258			
10%	0.45	0.11	0.236	0.036	0.014	0.374			
20%	0.078	0.026	0.329	0.018	0.008	0.438			
30%	0.002	0.000		0.011	0.005	0.473			
40%	0.000			0.009	0.003	0.374			
50%				0.006	0.002	0.286			
60%				0.005	0.001	0.133			
Avg	0.10	0.049	0.472	0.014	0.004	0.316			
	Refineries			**Rawhide**					
max	1.30	0.45	0.347	0.000	0.000				
5%	0.97	0.34	0.349						
10%	0.39	0.15	0.373						
20%	0.038	0.008	0.210						
30%	0.005	0.001	0.120						
40%	0.000	0.000							
50%									
60%									
Avg	0.10	0.036	0.356						

Table C.3-13
Cumulative Frequency Distributions of SO_2 Concentrations at CAMP during 01/13/97 to 01/21/97 Calculated by the Gridded Transport Simulations with and without Dry Deposition and by PUFF Transport Simulations

	SO_2 Concentrations (ppb)			
	UAM With Dry Deposition	UAM No Dry Deposition	SCIPUFF	UAM (No Deposition)/SCIPUFF
Cherokee				
max	24.0	40.9	3.09	13.3
5%	22.7	15.9	1.12	14.3
10%	16.3	10.5	0.85	12.4
20%	16.2	1.20	0.55	2.20
30%	14.7	0.17	0.38	0.44
40%	14.5	0.038	0.23	0.164
50%	14.1	0.005	0.15	0.033
60%	13.2	0.001	0.077	0.013
Avg	1.5	2.42	0.309	7.82
Valmont				
max	0.18	0.55	0.77	0.72
5%	0.18	0.12	0.42	0.29
10%	0.18	0.049	0.33	0.15
20%	0.130	0.007	0.23	0.029
30%	0.116	0.001	0.15	0.009
40%	0.068	0.000	0.10	0.001
50%	0.068		0.053	
60%	0.054		0.027	
Avg	0.052	0.023	0.11	0.198
Pawnee				
max	0.18	0.27	0.168	1.58
5%	0.050	0.20	0.053	3.79
10%	0.035	0.16	0.035	4.58
20%	0.000	0.002	0.007	0.284
30%		0.000	0.001	
40%			0.000	
50%				
60%				
Avg	0.008	0.027	0.008	3.13
Totals No Dry Deposition				
	UAM Total	UAM-SCIPUFF Hybrid Total	Measured SO2 Value	
max	50.6	33.7	73.0	
5%	30.6	19.4	33.0	
10%	26.1	15.5	24.0	
20%	13.7	10.3	15.0	
30%	7.30	7.86	12.0	
40%	4.74	5.41	10.0	
50%	3.81	4.17	6.0	
60%	2.46	3.13	5.0	
Avg	8.05	6.00	10.6	

Table C.3-14
Cumulative Frequency Distributions of SO_2 Concentrations at Welby during 01/13/97 to 01/21/97 Calculated by the Gridded Transport Simulations with and without Dry Deposition and by PUFF Transport Simulations

	SO_2 Concentrations (ppb)			
	UAM With Dry Deposition	UAM No Dry Deposition	SCIPUFF	UAM (No Deposition)/SCIPUFF
Cherokee				
max	103.92	122.85	5.42	22.66
5%	65.56	76.05	1.94	39.15
10%	40.16	44.41	1.24	35.74
20%	15.85	18.41	0.86	21.51
30%	9.16	10.61	0.55	19.42
40%	1.79	4.10	0.36	11.49
50%	0.360	0.741	0.25	3.02
60%	0.076	0.204	0.11	1.87
Avg	10.53	12.46	0.51	24.54
Valmont				
max	0.78	2.66	6.33	0.421
5%	0.21	0.43	0.48	0.886
10%	0.082	0.19	0.40	0.481
20%	0.019	0.043	0.29	0.151
30%	0.004	0.016	0.19	0.083
40%	0.001	0.003	0.14	0.025
50%	0.000	0.000	0.08	
60%			0.042	
Avg	0.033	0.088	0.19	0.462
Pawnee				
max	0.085	0.21	0.16	1.27
5%	0.052	0.17	0.045	3.86
10%	0.027	0.11	0.029	3.63
20%	0.000	0.002	0.006	0.266
30%	0.000	0.000	0.001	
40%			0.000	
50%				
60%				
Avg	0.006	0.020	0.008	2.58
Totals No Dry Deposition				
	UAM Total	UAM-SCIPUFF Hybrid Total	Measured Value	
max	134.3	37.4	72.2	
5%	84.2	26.4	17.2	
10%	54.64	22.4	9.8	
20%	29.51	16.53	6.74	
30%	21.82	13.35	4.56	
40%	16.02	10.75	2.97	
50%	13.01	8.78	2.11	
60%	9.56	7.26	1.27	
Avg	22.09	10.57	4.96	

Table C.3-15
Cumulative Frequency Distributions of SO_2 Concentrations at Brighton during 01/13/97 to 01/21/97 Calculated by the Gridded Transport Simulations with and without Dry Deposition and by PUFF Transport Simulations

	SO_2 Concentrations (ppb)			
	UAM With Dry Deposition	UAM No Dry Deposition	SCIPUFF	UAM (No Deposition)/SCIPUFF
Cherokee				
max	11.80	28.12	5.45	5.16
5%	5.06	8.66	1.87	4.63
10%	2.65	5.47	1.35	4.06
20%	1.07	2.50	0.83	3.03
30%	0.48	0.93	0.55	1.70
40%	0.13	0.23	0.38	0.60
50%	0.013	0.034	0.26	0.13
60%	0.006	0.009	0.14	0.063
Avg	0.83	1.65	0.51	3.24
Valmont				
max	1.88	6.03	3.37	1.79
5%	1.13	1.46	0.86	1.71
10%	0.48	0.73	0.61	1.20
20%	0.22	0.41	0.34	1.22
30%	0.11	0.17	0.26	0.640
40%	0.032	0.051	0.20	0.255
50%	0.006	0.012	0.16	0.075
60%	0.000	0.004	0.10	0.038
Avg	0.16	0.30	0.25	1.22
Pawnee				
max	0.23	0.50	0.15	3.33
5%	0.12	0.39	0.06	6.38
10%	0.041	0.12	0.03	3.83
20%	0.000	0.009	0.009	0.925
30%		0.000	0.002	
40%		0.000	0.000	
50%				
60%				
Avg	0.012	0.036	0.009	4.27
Totals No Dry Deposition				
	UAM Total	UAM-SCIPUFF Hybrid Total	Measured Value	
max	57.0	36.4	69.5	
5%	27.3	20.7	14.7	
10%	15.9	11.2	10.5	
20%	9.91	6.07	7.36	
30%	6.66	3.17	5.48	
40%	4.18	1.27	3.62	
50%	2.24	0.71	2.71	
60%	1.27	0.12	1.80	
Avg	6.17	3.58	5.84	

Table C.3-16
Cumulative Frequency Distributions of SO_2 Concentrations at Evans during 01/13/97 to 01/21/97 Calculated by the Gridded Transport Simulations with and without Dry Deposition and by PUFF Transport Simulations

	SO_2 Concentrations (ppb)			
	UAM With Dry Deposition	UAM No Dry Deposition	SCIPUFF	UAM (No Deposition)/SCIPUFF
Cherokee				
max	2.18	6.94	9.75	0.71
5%	1.46	4.67	2.08	2.25
10%	1.20	2.90	1.23	2.37
20%	0.48	1.62	0.69	2.35
30%	0.03	0.07	0.51	0.14
40%	0.00	0.01	0.33	0.035
50%	0.000	0.002	0.13	0.015
60%		0.000	0.030	0.010
Avg	0.26	0.77	0.50	1.53
Valmont				
max	1.04	3.36	1.36	2.47
5%	0.45	1.07	0.92	1.16
10%	0.31	0.83	0.76	1.09
20%	0.092	0.33	0.56	0.589
30%	0.066	0.19	0.42	0.452
40%	0.036	0.115	0.25	0.462
50%	0.014	0.062	0.13	0.465
60%	0.001	0.006	0.059	0.105
Avg	0.082	0.24	0.28	0.870
Pawnee				
max	0.062	0.12	0.059	2.01
5%	0.024	0.07	0.041	1.70
10%	0.008	0.03	0.033	0.954
20%	0.000	0.004	0.012	0.348
30%		0.000	0.002	
40%			0.000	
50%				
60%				
Avg	0.002	0.008	0.007	1.10
Totals No Dry Deposition				
	UAM Total	UAM-SCIPUFF Hybrid Total	Measured Value	
max	11.4	11.9	5.6	
5%	8.1	4.8	3.6	
10%	5.90	4.0	2.5	
20%	3.66	3.16	1.92	
30%	1.83	2.45	1.37	
40%	1.23	1.62	1.08	
50%	0.96	1.23	0.98	
60%	0.70	0.99	0.62	
Avg	2.01	1.82	1.41	

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APPENDIX C.1A

Contributions to $PM_{2.5}$ Mass, Carbon, Sulfur Dioxide, and Oxides of Nitrogen at Core Sites for Individual Samples – NFRAQS Winter 1996/97, Extended Species CMB

Table C.1A-1
Contributions to $PM_{2.5}$ Mass at Core Sites for Individual Samples - NFRAQS Winter 1996/97, Extended Species CMB

Site ID	Date	Start Hour	Duration (hrs)	$PM_{2.5}$ ($\mu g/m^3$)	R-square	Chi-square	Percent of Mass	Incremental cold start ("puffers")	Hot stabilized, non-smoking	Smoking LDGV exhaust	Diesel Exhaust
BRIGHT	12/18/96	06	6	7.6562 ± 0.69683	0.94696	0.24884	107.156	-0.29543 ± 0.36204	0.06488 ± 0.07669	3.98555 ± 0.88277	1.41339 ± 0.41913
BRIGHT	12/18/96	12	6	7.4725 ± 0.73544	0.86814	0.4292	67.2689	-0.09197 ± 0.22678	0.0743 ± 0.05264	1.97297 ± 0.71344	0.28763 ± 0.32829
BRIGHT	12/18/96	18	12	4.5202 ± 0.37245	0.91877	0.55765	174.449	0.15838 ± 0.23516	0.11985 ± 0.05601	2.61354 ± 0.50755	1.73716 ± 0.36296
BRIGHT	12/19/96	06	6	15.3888 ± 0.96917	0.90093	0.71493	97.5913	0.93844 ± 0.74198	0.37473 ± 0.15052	4.98185 ± 1.29673	1.35351 ± 0.61201
BRIGHT	12/19/96	12	6	30.1034 ± 1.61353	0.95264	0.28973	87.797	1.56472 ± 1.12371	0.60881 ± 0.24364	4.98608 ± 1.27541	2.60672 ± 0.85901
BRIGHT	12/19/96	18	12	5.6681 ± 0.4092	0.95264	0.27804	97.5091	0.38167 ± 0.32229	0.26983 ± 0.07627	1.37953 ± 0.40698	0.84163 ± 0.27331
BRIGHT	12/20/96	06	6	5.1643 ± 0.64965	0.94627	0.1404	98.4816	-0.4143 ± 0.31785	0.02898 ± 0.06336	2.15974 ± 0.59223	1.28983 ± 0.37733
BRIGHT	12/25/96	06	6	2.6698 ± 0.6386	0.82737	0.3782	122.389	0.01833 ± 0.22319	0.15373 ± 0.05744	1.74042 ± 0.67892	0.30063 ± 0.31835
BRIGHT	12/25/96	12	6	3.28 ± 0.64009	0.86192	0.49436	116.647	-0.06704 ± 0.20268	0.08209 ± 0.04727	1.40522 ± 0.67966	0.10309 ± 0.30477
BRIGHT	12/25/96	18	12	9.0632 ± 0.54261	0.90966	0.38346	111.531	0.05343 ± 0.18726	0.00422 ± 0.04651	0.31887 ± 0.32805	0.23238 ± 0.19674
BRIGHT	12/26/96	06	6	15.9692 ± 0.99885	0.95011	0.23806	85.5113	0.10051 ± 0.27544	0.01148 ± 0.06958	1.75381 ± 0.58084	0.5138 ± 0.32397
BRIGHT	12/26/96	12	6	10.9125 ± 0.8061	0.91168	0.4276	114.996	0.19351 ± 0.27746	0.08474 ± 0.06722	0.09558 ± 0.88985	0.38375 ± 0.37937
BRIGHT	12/26/96	18	12	6.4314 ± 0.43336	0.94882	0.26857	120.921	0.2282 ± 0.22317	0.10292 ± 0.05355	0.64712 ± 0.32378	0.42583 ± 0.19739
BRIGHT	12/30/96	06	6	5.1021 ± 0.65145	0.90027	0.34308	107.852	0.08672 ± 0.30877	0.35701 ± 0.0912	0.67429 ± 0.93649	1.07634 ± 0.3661
BRIGHT	12/30/96	12	6	4.6439 ± 0.63688	0.8281	0.45871	97.5083	-0.18003 ± 0.32771	0.37875 ± 0.09519	0.73336 ± 0.88303	1.1875 ± 0.37608
BRIGHT	12/30/96	18	12	4.0318 ± 0.36286	0.91522	0.48103	109.215	0.3487 ± 0.28395	0.13608 ± 0.05373	0.6587 ± 0.52289	0.85647 ± 0.26105
BRIGHT	12/31/96	06	6	10.2288 ± 0.81266	0.95116	0.21564	108.314	-0.47776 ± 0.4347	0.01655 ± 0.08721	3.77534 ± 1.10719	2.43776 ± 0.55523
BRIGHT	12/31/96	12	6	7.1349 ± 0.70241	0.92289	0.39994	134.718	0.09317 ± 0.23841	0.11413 ± 0.06187	1.73716 ± 0.60436	1.6438 ± 0.40983
BRIGHT	12/31/96	18	12	4.4321 ± 0.36994	0.88751	0.5466	117.748	0.5212 ± 0.31016	0.12225 ± 0.05848	1.53528 ± 0.4194	0.90008 ± 0.28014
BRIGHT	01/01/97	06	6	4.2287 ± 0.63897	0.89792	0.39318	113.824	0.7389 ± 0.44193	0.16739 ± 0.08315	0.91633 ± 0.59088	-0.07896 ± 0.3597
BRIGHT	01/01/97	12	6	12.4145 ± 0.88107	0.87896	0.65062	134.745	0.52977 ± 0.48658	0.07543 ± 0.11091	3.27441 ± 0.78961	1.48408 ± 0.47524
BRIGHT	01/01/97	18	12	4.5156 ± 0.37325	0.92624	0.41979	127.122	0.17901 ± 0.22155	0.12881 ± 0.05122	1.89445 ± 0.54881	0.85049 ± 0.24667
BRIGHT	01/02/97	06	6	7.1772 ± 0.69687	0.90415	0.30344	110.666	0.33688 ± 0.38435	0.2581 ± 0.08974	2.6285 ± 0.97679	1.4433 ± 0.43989
BRIGHT	01/02/97	12	6	5.4328 ± 0.65115	0.88166	0.41006	142.416	-0.12466 ± 0.31315	0.33856 ± 0.09531	2.51724 ± 0.67667	1.06095 ± 0.36959
BRIGHT	01/02/97	18	12	4.1873 ± 0.38173	0.94117	0.30128	156.115	0.56669 ± 0.35552	0.12774 ± 0.066	1.60802 ± 0.63961	1.07383 ± 0.31975
BRIGHT	01/06/97	06	6	3.7317 ± 0.63388	0.91285	0.28958	109.72	-99 ± 0	0.45263 ± 0.09341	0.25581 ± 0.64532	0.14162 ± 0.30749
BRIGHT	01/06/97	12	6	6.1379 ± 0.67148	0.97759	0.08534	110.339	-0.33646 ± 0.50626	0.02684 ± 0.09017	1.77734 ± 0.80886	0.99736 ± 0.39572
BRIGHT	01/06/97	18	12	7.6448 ± 0.4836	0.947	0.30669	96.1483	-0.0575 ± 0.1934	0.05237 ± 0.04613	2.00992 ± 0.62375	1.35117 ± 0.29271
BRIGHT	01/07/97	06	6	11.8064 ± 0.83596	0.9656	0.15628	103.44	-0.58682 ± 0.46307	-0.07434 ± 0.09523	3.62782 ± 0.7878	2.69691 ± 0.58004
BRIGHT	01/07/97	12	6	16.1171 ± 0.98144	0.9621	0.19814	102.617	-0.00562 ± 0.35812	0.09172 ± 0.08887	3.00472 ± 1.17642	2.24556 ± 0.51576
BRIGHT	01/07/97	18	12	4.8814 ± 0.38372	0.95963	0.20596	107.482	0.05847 ± 0.14846	0.16226 ± 0.04755	0.70617 ± 0.30636	0.2617 ± 0.15972
BRIGHT	01/08/97	06	6	17.4526 ± 1.04585	0.97186	0.13964	93.4303	0.96087 ± 0.67521	0.03048 ± 0.13278	2.92106 ± 0.79871	1.61859 ± 0.55854
BRIGHT	01/12/97	06	6	3.3152 ± 0.63015	0.8585	0.32911	59.4525	-0.15919 ± 0.19101	0.0516 ± 0.04251	0.68304 ± 0.59731	0.16933 ± 0.28837
BRIGHT	01/12/97	12	6	4.1406 ± 0.61889	0.9147	0.2786	83.8301	-0.17766 ± 0.19614	0.04693 ± 0.04407	1.05069 ± 0.54143	0.23305 ± 0.27755

Table C.1A-1 (continued)
Contributions to $PM_{2.5}$ Mass at Core Sites for Individual Samples - NFRAQS Winter 1996/97, Extended Species CMB

Site ID	Date	Start Hour	Duration (hrs)	Meat Cooking	Wood Combustion (Softwood)	Wood Combustion (Hardwood)	Paved Road Dust	Ammonium Sulfate	Ammonium Nitrate	Coal-Fired Powerplant
BRIGHT	12/18/96	06	6	-0.53476 ± 0.451	0.02353 ± 0.07864	-0.01671 ± 0.12318	0.80114 ± 0.36222	1.07959 ± 0.13747	1.65713 ± 0.18358	0.02574 ± 0.4367
BRIGHT	12/18/96	12	6	-0.31429 ± 0.34834	0.01423 ± 0.07337	-0.05022 ± 0.18085	1.39618 ± 0.46962	0.62216 ± 0.11218	0.61747 ± 0.09654	0.4982 ± 0.51399
BRIGHT	12/18/96	18	12	-99 ± 0	0.0779 ± 0.08432	0.04271 ± 0.19315	0.47665 ± 0.21394	1.27302 ± 0.13961	1.51097 ± 0.16307	-0.12477 ± 0.25099
BRIGHT	12/19/96	06	6	-0.27811 ± 0.57893	0.49497 ± 0.28991	0.08416 ± 0.40607	1.1548 ± 0.47716	2.20743 ± 0.25648	3.87075 ± 0.39073	-0.16441 ± 0.54664
BRIGHT	12/19/96	12	6	-99 ± 0	0.11335 ± 0.29803	0.48378 ± 0.57418	2.01054 ± 0.72325	3.45471 ± 0.53218	11.0155 ± 1.02617	-0.41435 ± 0.78634
BRIGHT	12/19/96	18	12	-99 ± 0	0.05657 ± 0.07732	0.01823 ± 0.14569	0.43259 ± 0.18116	0.70967 ± 0.08923	1.59248 ± 0.15654	-0.15529 ± 0.21966
BRIGHT	12/20/96	06	6	-99 ± 0	0.01133 ± 0.07063	-0.01324 ± 0.09264	0.6045 ± 0.2772	0.28003 ± 0.07492	1.04233 ± 0.12289	0.09669 ± 0.34856
BRIGHT	12/25/96	06	6	-0.1401 ± 0.31676	0.07396 ± 0.07808	-0.00305 ± 0.11979	0.63298 ± 0.28344	0.11163 ± 0.06552	0.28516 ± 0.07167	0.09387 ± 0.3501
BRIGHT	12/25/96	12	6	-0.2157 ± 0.30056	0.01637 ± 0.06396	-0.01168 ± 0.10468	0.70771 ± 0.30094	0.43345 ± 0.08468	1.19244 ± 0.13472	0.18006 ± 0.36312
BRIGHT	12/25/96	18	12	-99 ± 0	0.01136 ± 0.09397	0.04798 ± 0.14822	0.39488 ± 0.17995	2.69128 ± 0.3443	6.41221 ± 0.60818	-0.05832 ± 0.21719
BRIGHT	12/26/96	06	6	-99 ± 0	0.03669 ± 0.13309	-0.03512 ± 0.20751	1.3723 ± 0.50277	3.16719 ± 0.38883	6.60354 ± 0.64028	0.13125 ± 0.56891
BRIGHT	12/26/96	12	6	0.6284 ± 0.54825	0.0353 ± 0.11081	0.14393 ± 0.1623	1.77876 ± 0.53973	2.78135 ± 0.35254	6.26949 ± 0.60289	0.15411 ± 0.52444
BRIGHT	12/26/96	18	12	-99 ± 0	0.01925 ± 0.08141	0.01501 ± 0.10585	1.01416 ± 0.30913	1.59479 ± 0.19897	3.58107 ± 0.34212	0.14852 ± 0.29512
BRIGHT	12/30/96	06	6	0.67534 ± 0.51436	0.00391 ± 0.11146	0.32922 ± 0.21895	1.16853 ± 0.39006	0.42446 ± 0.08723	0.38843 ± 0.07779	0.31846 ± 0.4138
BRIGHT	12/30/96	12	6	-0.28663 ± 0.39993	-0.05313 ± 0.09822	0.25731 ± 0.21141	1.61456 ± 0.48983	0.49064 ± 0.09021	0.22298 ± 0.07088	0.16287 ± 0.47581
BRIGHT	12/30/96	18	12	-0.1179 ± 0.26725	0.12013 ± 0.10366	0.30737 ± 0.15486	0.92484 ± 0.28659	0.55955 ± 0.07047	0.51807 ± 0.06554	0.09131 ± 0.27104
BRIGHT	12/31/96	06	6	-0.39093 ± 0.62439	0.01283 ± 0.08941	-0.01296 ± 0.1238	2.26275 ± 0.71236	0.80871 ± 0.14232	2.5002 ± 0.25483	0.14669 ± 0.6975
BRIGHT	12/31/96	12	6	-99 ± 0	-0.00214 ± 0.08659	-0.0072 ± 0.11927	1.85651 ± 0.57499	0.77191 ± 0.13802	2.97229 ± 0.2796	0.43237 ± 0.56933
BRIGHT	12/31/96	18	12	-99 ± 0	0.05895 ± 0.06313	0.01006 ± 0.0919	1.30049 ± 0.3727	0.32959 ± 0.05907	0.2968 ± 0.04774	0.144 ± 0.29663
BRIGHT	01/01/97	06	6	-99 ± 0	-99 ± 0	0.1114 ± 0.12431	1.16107 ± 0.40912	0.43182 ± 0.09053	1.44297 ± 0.15394	-0.07765 ± 0.44828
BRIGHT	01/01/97	12	6	-99 ± 0	-0.04667 ± 0.14108	0.02693 ± 0.21728	3.52334 ± 0.94627	1.28876 ± 0.24884	6.80069 ± 0.60896	-0.22878 ± 0.74572
BRIGHT	01/01/97	18	12	-0.25361 ± 0.29267	-0.01727 ± 0.04928	0.00389 ± 0.08666	1.57148 ± 0.42884	0.46328 ± 0.07231	0.85127 ± 0.09501	0.06855 ± 0.329
BRIGHT	01/02/97	06	6	-0.2036 ± 0.51642	-0.02171 ± 0.08659	0.10727 ± 0.16768	2.58378 ± 0.71604	0.26483 ± 0.1019	0.21515 ± 0.0774	0.33021 ± 0.57298
BRIGHT	01/02/97	12	6	-99 ± 0	-0.0284 ± 0.07717	-0.00142 ± 0.12609	3.05272 ± 0.79554	0.40145 ± 0.10072	0.4752 ± 0.08597	0.04555 ± 0.58963
BRIGHT	01/02/97	18	12	-0.28287 ± 0.34811	0.00599 ± 0.05871	0.00151 ± 0.10617	1.74792 ± 0.49154	0.52536 ± 0.10769	1.11885 ± 0.13393	0.04395 ± 0.42262
BRIGHT	01/06/97	06	6	-99 ± 0	0.34749 ± 0.18954	0.15399 ± 0.2698	0.25776 ± 0.15594	0.2637 ± 0.06444	2.1821 ± 0.21871	0.03931 ± 0.19609
BRIGHT	01/06/97	12	6	-0.24853 ± 0.45562	0.00305 ± 0.08782	-0.00455 ± 0.11181	0.25839 ± 0.19009	0.73541 ± 0.10455	3.56482 ± 0.32074	-0.00118 ± 0.25881
BRIGHT	01/06/97	18	12	-0.26721 ± 0.37855	-0.00232 ± 0.06098	0.05541 ± 0.09718	0.46759 ± 0.20554	1.08117 ± 0.12816	2.70707 ± 0.25991	-0.04732 ± 0.24208
BRIGHT	01/07/97	06	6	-99 ± 0	0.01573 ± 0.09796	-0.01764 ± 0.1106	1.5191 ± 0.54369	1.01828 ± 0.15249	3.9885 ± 0.37196	0.02498 ± 0.6053
BRIGHT	01/07/97	12	6	-0.50766 ± 0.71572	-0.04851 ± 0.12825	0.02943 ± 0.19041	2.99612 ± 0.83967	1.17824 ± 0.18276	7.29456 ± 0.62554	0.26035 ± 0.70969
BRIGHT	01/07/97	18	12	-99 ± 0	-0.00488 ± 0.04835	0.04817 ± 0.08542	1.25737 ± 0.34782	0.7967 ± 0.10117	1.9625 ± 0.19188	-0.00182 ± 0.30845
BRIGHT	01/08/97	06	6	-99 ± 0	0.01342 ± 0.17341	-0.00871 ± 0.263	0.73318 ± 0.35782	1.97491 ± 0.28993	7.93518 ± 0.70964	0.12703 ± 0.45107
BRIGHT	01/12/97	06	6	-0.21365 ± 0.29201	0.02778 ± 0.05738	0.02668 ± 0.08508	0.24697 ± 0.16426	0.83027 ± 0.09654	0.34921 ± 0.07629	-0.04105 ± 0.21466
BRIGHT	01/12/97	12	6	-99 ± 0	0.04625 ± 0.04635	-0.0026 ± 0.08873	0.486 ± 0.23324	0.86233 ± 0.10607	0.85114 ± 0.11152	0.07495 ± 0.28962

Table C.1A-1 (continued)

Contributions to $PM_{2.5}$ Mass at Core Sites for Individual Samples - NFRAQS Winter 1996/97, Extended Species CMB

Site ID	Date	Start Hour	Duration (hrs)	$PM_{2.5}$ ($\mu g/m^3$)	R-square	Chi-square	Percent of Mass	Incremental cold start ("puffers")	Hot stabilized, non-smoking	Smoking LDGV exhaust	Diesel Exhaust
BRIGHT	01/12/97	18	12	12.6582 ± 0.69658	0.88073	0.6962	91.9326	-0.03254 ± 0.23087	0.00985 ± 0.06043	2.7407 ± 0.48764	0.95552 ± 0.26357
BRIGHT	01/13/97	06	6	13.8308 ± 0.90326	0.96715	0.16167	104.478	-0.32374 ± 0.39234	-0.00146 ± 0.09493	3.97639 ± 0.7226	1.25678 ± 0.41676
BRIGHT	01/13/97	12	6	22.1234 ± 1.25857	0.96866	0.1359	83.0781	-0.61739 ± 0.55779	-0.04892 ± 0.12964	4.54889 ± 0.8124	1.27218 ± 0.47704
BRIGHT	01/13/97	18	12	23.4376 ± 1.17807	0.95778	0.25771	90.2663	0.04394 ± 0.40639	0.08154 ± 0.11327	4.31126 ± 0.70573	1.82609 ± 0.43646
BRIGHT	01/14/97	06	6	30.7615 ± 1.64365	0.95196	0.28788	91.2966	0.90562 ± 0.86474	-0.05194 ± 0.19015	6.33636 ± 1.84853	1.84604 ± 0.67869
BRIGHT	01/14/97	12	6	17.3214 ± 1.01222	0.96109	0.19749	69.8811	-0.29452 ± 0.40978	0.23588 ± 0.10375	3.43458 ± 0.98633	0.76285 ± 0.38432
BRIGHT	01/14/97	18	12	16.6298 ± 0.87925	0.95692	0.28384	97.1516	0.46992 ± 0.47702	0.16535 ± 0.1113	3.92042 ± 0.99436	1.42954 ± 0.41932
BRIGHT	01/15/97	06	6	12.9245 ± 0.87554	0.95308	0.22366	62.4223	-0.39822 ± 0.36893	0.1924 ± 0.08309	2.58537 ± 0.80023	0.76841 ± 0.35816
BRIGHT	01/15/97	12	6	5.4015 ± 0.65095	0.94333	0.28034	116.239	0.02757 ± 0.21415	0.12213 ± 0.05481	1.0966 ± 0.71449	0.40561 ± 0.34165
BRIGHT	01/15/97	18	12	5.1629 ± 0.39083	0.96899	0.13518	98.3563	-0.34256 ± 0.25078	0.0901 ± 0.05134	1.33597 ± 0.45683	0.27423 ± 0.21373
BRIGHT	01/16/97	06	6	8.7545 ± 0.73325	0.95821	0.20078	91.6799	-0.30094 ± 0.29826	0.10324 ± 0.06903	2.06726 ± 0.58433	1.11064 ± 0.36107
BRIGHT	01/16/97	12	6	8.8515 ± 0.74561	0.96945	0.13287	92.5676	-0.48413 ± 0.39923	-0.00528 ± 0.08041	2.83101 ± 0.863	0.72908 ± 0.37701
BRIGHT	01/16/97	18	12	17.7939 ± 0.93127	0.91445	0.58308	89.7666	0.12963 ± 0.30667	-0.03036 ± 0.0801	3.25725 ± 0.5905	1.72135 ± 0.3923
BRIGHT	01/17/97	06	6	31.5056 ± 1.67859	0.93106	0.44455	95.7647	0.82443 ± 0.8013	0.15953 ± 0.186	6.26572 ± 1.21783	3.42694 ± 0.8268
BRIGHT	01/17/97	12	6	30.2378 ± 1.61409	0.95877	0.23938	97.3321	1.35435 ± 1.07144	0.18974 ± 0.22213	1.77218 ± 2.32279	2.06472 ± 0.75784
BRIGHT	01/17/97	18	12	23.3804 ± 1.20278	0.93145	0.40475	88.3774	0.88654 ± 0.64122	0.02424 ± 0.1349	3.26932 ± 0.77511	2.70901 ± 0.62403
BRIGHT	01/18/97	06	6	5.8246 ± 0.6665	0.92153	0.37625	141.516	0.82823 ± 0.53699	0.25522 ± 0.1059	2.77588 ± 0.75501	1.46682 ± 0.48989
BRIGHT	01/18/97	12	6	7.2224 ± 0.68977	0.94237	0.24048	113.987	1.15179 ± 0.58702	0.03221 ± 0.10036	1.57324 ± 0.67972	0.91224 ± 0.46504
BRIGHT	01/18/97	18	12	8.5612 ± 0.5117	0.92797	0.40816	101.699	0.34957 ± 0.30251	0.01405 ± 0.06536	2.20595 ± 0.4747	1.04492 ± 0.30575
BRIGHT	01/19/97	06	6	4.704 ± 0.63705	0.93331	0.25646	157.052	-0.38247 ± 0.33793	0.09584 ± 0.07413	2.59391 ± 0.61556	1.01946 ± 0.36803
BRIGHT	01/19/97	12	6	6.3233 ± 0.67327	0.86155	0.43767	104.965	-0.1798 ± 0.30235	0.01085 ± 0.06635	3.65494 ± 0.77483	0.65402 ± 0.35338
BRIGHT	01/19/97	18	12	22.0002 ± 1.12935	0.96338	0.21055	90.0162	1.25076 ± 0.85267	0.14932 ± 0.1712	3.06755 ± 1.41545	1.28146 ± 0.56639
BRIGHT	01/20/97	06	6	13.0507 ± 0.87434	0.904	0.4892	93.451	0.08958 ± 0.39686	0.40186 ± 0.1157	3.80644 ± 0.85429	2.26824 ± 0.53821
BRIGHT	01/20/97	12	6	8.6119 ± 0.7464	0.90779	0.43139	128.735	-0.17737 ± 0.31278	0.15923 ± 0.07932	2.68283 ± 0.745	2.80192 ± 0.57307
BRIGHT	01/27/97	06	6	8.1573 ± 0.72042	0.96685	0.13429	89.2059	-0.11985 ± 0.22515	-0.04496 ± 0.0524	1.16865 ± 0.7162	0.42202 ± 0.33337
BRIGHT	01/27/97	12	6	4.0178 ± 0.62791	0.92615	0.27244	94.4204	0.30767 ± 0.27347	-0.02184 ± 0.05519	-0.11733 ± 0.78584	0.1986 ± 0.31691
BRIGHT	01/27/97	18	12	11.0633 ± 0.62593	0.93919	0.35318	99.0156	0.82505 ± 0.48094	-0.00449 ± 0.08997	1.99133 ± 0.5164	1.10602 ± 0.37797
BRIGHT	01/28/97	12	6	27.7687 ± 1.50175	0.94523	0.28944	76.6791	1.7222 ± 0.99359	-0.1054 ± 0.18548	2.68424 ± 0.95694	1.6524 ± 0.71324
BRIGHT	01/28/97	18	12	5.1542 ± 0.38293	0.91035	0.48349	86.72	0.14844 ± 0.17535	0.13442 ± 0.04498	0.5278 ± 0.45282	0.25175 ± 0.16724
BRIGHT	01/29/97	06	6	8.8709 ± 0.7413	0.95747	0.19574	102.231	1.92084 ± 0.86306	-0.13438 ± 0.13655	0.45696 ± 1.34184	-0.41855 ± 0.62599
BRIGHT	01/29/97	12	6	5.1824 ± 0.64704	0.92903	0.33933	114.113	0.71144 ± 0.4653	0.12851 ± 0.08321	0.22803 ± 0.97223	0.1944 ± 0.40419
BRIGHT	01/29/97	18	12	4.1719 ± 0.36119	0.95258	0.23933	104.998	-0.04761 ± 0.12908	0.00875 ± 0.03037	1.44942 ± 0.32134	0.87436 ± 0.21242
BRIGHT	01/30/97	06	6	7.9925 ± 0.70195	0.90171	0.48854	124.391	0.39985 ± 0.4102	0.09868 ± 0.08292	3.93031 ± 0.95626	1.57696 ± 0.46697
BRIGHT	01/30/97	12	6	3.085 ± 0.61193	0.87866	0.24076	125.023	-0.19385 ± 0.23818	0.12753 ± 0.05672	1.91428 ± 0.59818	0.38064 ± 0.34756
BRIGHT	01/30/97	18	12	1.6896 ± 0.30939	0.89778	0.33437	155.019	-0.00998 ± 0.11199	0.06863 ± 0.02883	1.15224 ± 0.29711	0.55446 ± 0.17417

Table C.1A-1 (continued)
Contributions to $PM_{2.5}$ Mass at Core Sites for Individual Samples - NFRAQS Winter 1996/97, Extended Species CMB

Site ID	Date	Start Hour	Duration (hrs)	Meat Cooking	Wood Combustion (Softwood)	Wood Combustion (Hardwood)	Paved Road Dust	Ammonium Sulfate	Ammonium Nitrate	Coal-Fired Powerplant
BRIGHT	01/12/97	18	12	-99 ± 0	-0.00826 ± 0.08915	0.12221 ± 0.13293	2.03447 ± 0.5584	1.55749 ± 0.24657	4.11239 ± 0.40413	0.14517 ± 0.44329
BRIGHT	01/13/97	06	6	-99 ± 0	-0.02471 ± 0.11937	0.05547 ± 0.17402	0.92927 ± 0.41418	2.1856 ± 0.26483	6.0827 ± 0.59633	0.31383 ± 0.49756
BRIGHT	01/13/97	12	6	-99 ± 0	-0.00028 ± 0.15807	0.07279 ± 0.21668	1.44527 ± 0.56781	3.45338 ± 0.51498	8.36273 ± 0.82628	-0.10894 ± 0.64372
BRIGHT	01/13/97	18	12	-99 ± 0	0.01558 ± 0.18102	0.1791 ± 0.24772	1.25411 ± 0.47445	3.15153 ± 0.40786	10.4347 ± 0.93404	-0.14163 ± 0.52619
BRIGHT	01/14/97	06	6	-0.22767 ± 1.07243	0.06462 ± 0.28841	0.58075 ± 0.50212	1.673 ± 0.6818	4.96406 ± 0.65413	11.984 ± 1.14517	0.0094 ± 0.77844
BRIGHT	01/14/97	12	6	-0.17165 ± 0.53368	0.0822 ± 0.12026	-0.02667 ± 0.14857	0.43471 ± 0.3087	3.15181 ± 0.36817	4.65774 ± 0.47565	-0.16255 ± 0.38579
BRIGHT	01/14/97	18	12	-0.35279 ± 0.57097	0.11312 ± 0.13814	0.08773 ± 0.19448	0.66396 ± 0.30881	4.71957 ± 0.50077	5.25599 ± 0.56562	-0.31669 ± 0.36614
BRIGHT	01/15/97	06	6	-0.29444 ± 0.38607	0.02235 ± 0.08067	0.0479 ± 0.1141	1.48552 ± 0.52181	1.86582 ± 0.20307	1.6536 ± 0.18933	0.13904 ± 0.57248
BRIGHT	01/15/97	12	6	0.30061 ± 0.38918	0.03701 ± 0.08052	-0.00111 ± 0.10844	0.43075 ± 0.22063	1.63407 ± 0.18132	2.1621 ± 0.2278	0.06329 ± 0.27271
BRIGHT	01/15/97	18	12	-0.06729 ± 0.24154	0.01744 ± 0.05171	-0.00729 ± 0.06221	0.50431 ± 0.21295	1.80325 ± 0.18528	1.31293 ± 0.16152	0.15694 ± 0.25311
BRIGHT	01/16/97	06	6	-99 ± 0	0.0097 ± 0.08004	0.00792 ± 0.11678	0.60759 ± 0.28426	1.63971 ± 0.1928	2.34325 ± 0.24569	0.43775 ± 0.34986
BRIGHT	01/16/97	12	6	-0.13146 ± 0.44132	0.04951 ± 0.09289	0.03105 ± 0.11671	1.04511 ± 0.41853	1.95846 ± 0.21517	2.16887 ± 0.2371	0.00141 ± 0.48653
BRIGHT	01/16/97	18	12	-99 ± 0	0.18508 ± 0.17637	0.13102 ± 0.17868	1.66145 ± 0.51838	2.74766 ± 0.32041	5.90654 ± 0.56715	0.26336 ± 0.50474
BRIGHT	01/17/97	06	6	-99 ± 0	0.07986 ± 0.27227	0.34395 ± 0.4171	2.27372 ± 0.81228	5.3217 ± 0.68613	11.5453 ± 1.12169	-0.06986 ± 0.88376
BRIGHT	01/17/97	12	6	1.60337 ± 1.53526	0.35017 ± 0.36101	0.16528 ± 0.40087	1.25255 ± 0.51761	3.96652 ± 0.47212	16.8024 ± 1.47672	-0.09016 ± 0.62803
BRIGHT	01/17/97	18	12	-99 ± 0	0.00201 ± 0.17549	0.1616 ± 0.22781	2.62931 ± 0.7392	2.55208 ± 0.35314	8.82936 ± 0.79977	-0.40049 ± 0.62787
BRIGHT	01/18/97	06	6	-99 ± 0	0.05257 ± 0.09378	0.11549 ± 0.16323	0.76971 ± 0.33733	0.3624 ± 0.0866	1.69139 ± 0.17742	-0.07497 ± 0.41535
BRIGHT	01/18/97	12	6	-99 ± 0	-0.00433 ± 0.09445	0.08297 ± 0.14199	0.57553 ± 0.26797	0.3919 ± 0.08607	3.40293 ± 0.30085	0.11411 ± 0.34605
BRIGHT	01/18/97	18	12	-99 ± 0	0.1676 ± 0.13819	0.11598 ± 0.14006	0.61794 ± 0.25096	0.51936 ± 0.07938	3.80038 ± 0.3291	-0.12911 ± 0.29639
BRIGHT	01/19/97	06	6	-99 ± 0	0.03058 ± 0.08135	0.03551 ± 0.10164	0.285 ± 0.21266	0.42157 ± 0.08604	3.03904 ± 0.27696	0.24929 ± 0.28608
BRIGHT	01/19/97	12	6	-0.26312 ± 0.3205	-0.00461 ± 0.06855	-0.02197 ± 0.09957	1.33297 ± 0.47995	0.18118 ± 0.08877	1.14258 ± 0.13718	0.13022 ± 0.53034
BRIGHT	01/19/97	18	12	-0.07365 ± 0.87799	0.00368 ± 0.21244	0.24718 ± 0.27791	0.70953 ± 0.33085	1.57839 ± 0.19776	11.792 ± 0.99776	-0.20246 ± 0.41778
BRIGHT	01/20/97	06	6	-99 ± 0	0.01215 ± 0.10576	0.17024 ± 0.19055	3.1201 ± 0.87389	0.36062 ± 0.12763	1.54387 ± 0.17246	0.42291 ± 0.73311
BRIGHT	01/20/97	12	6	-99 ± 0	0.03052 ± 0.10483	0.0961 ± 0.15294	0.87634 ± 0.36246	0.32447 ± 0.10522	3.83262 ± 0.3437	0.45991 ± 0.43807
BRIGHT	01/27/97	06	6	0.10615 ± 0.41118	0.01805 ± 0.0937	0.01977 ± 0.12182	0.40524 ± 0.22393	1.7824 ± 0.20656	3.63572 ± 0.35567	-0.1164 ± 0.27986
BRIGHT	01/27/97	12	6	0.76035 ± 0.45721	0.0003 ± 0.0842	0.0185 ± 0.13845	0.15096 ± 0.14151	1.12265 ± 0.12834	1.28173 ± 0.14791	0.09203 ± 0.2127
BRIGHT	01/27/97	18	12	-99 ± 0	0.00608 ± 0.10153	0.11056 ± 0.13906	1.07227 ± 0.36891	1.59269 ± 0.1914	4.4872 ± 0.41423	-0.23232 ± 0.38913
BRIGHT	01/28/97	12	6	-99 ± 0	0.01388 ± 0.22619	0.26836 ± 0.32858	1.97451 ± 0.6841	2.60557 ± 0.32422	10.6417 ± 0.93009	-0.16466 ± 0.73982
BRIGHT	01/28/97	18	12	0.26233 ± 0.25897	-0.02612 ± 0.04535	0.0466 ± 0.07469	0.16952 ± 0.10395	0.82938 ± 0.09833	2.10746 ± 0.20105	0.01814 ± 0.13855
BRIGHT	01/29/97	06	6	1.56063 ± 0.76588	-0.01103 ± 0.12001	-0.00652 ± 0.26028	0.8443 ± 0.3511	1.41381 ± 0.17975	3.22236 ± 0.31269	0.22041 ± 0.42112
BRIGHT	01/29/97	12	6	1.1002 ± 0.57634	0.02209 ± 0.09202	-0.02911 ± 0.12452	0.21129 ± 0.17598	1.46198 ± 0.16433	1.93256 ± 0.20597	-0.04762 ± 0.23456
BRIGHT	01/29/97	18	12	-99 ± 0	-0.00317 ± 0.04008	-0.00978 ± 0.05495	0.23515 ± 0.13723	0.87372 ± 0.09583	0.90045 ± 0.10074	0.09911 ± 0.1701
BRIGHT	01/30/97	06	6	0.13202 ± 0.44453	0.00911 ± 0.08728	-0.00021 ± 0.14741	1.55608 ± 0.54206	0.28178 ± 0.11469	1.41734 ± 0.15917	0.54005 ± 0.58632
BRIGHT	01/30/97	12	6	-99 ± 0	-0.00588 ± 0.05718	-0.00786 ± 0.09795	0.71288 ± 0.30394	0.14672 ± 0.07846	0.48611 ± 0.09007	0.29637 ± 0.37099
BRIGHT	01/30/97	18	12	-99 ± 0	-0.00715 ± 0.03252	-0.00196 ± 0.0578	0.33705 ± 0.14698	0.21231 ± 0.0421	0.17525 ± 0.03805	0.13835 ± 0.17896

Table C.1A-1 (continued)
Contributions to $PM_{2.5}$ Mass at Core Sites for Individual Samples - NFRAQS Winter 1996/97, Extended Species CMB

Site ID	Date	Start Hour	Duration (hrs)	$PM_{2.5}$ ($\mu g/m^3$)	R-square	Chi-square	Percent of Mass	Incremental cold start ("puffers")	Hot stabilized, non-smoking	Smoking LDGV exhaust	Diesel Exhaust
WELBY	12/18/96	12	6	4.9546 ± 0.61621	0.90377	0.4508	107.705	-0.08367 ± 0.33191	0.45012 ± 0.10548	1.56221 ± 0.78339	0.71141 ± 0.34572
WELBY	12/19/96	06	6	17.2947 ± 1.04228	0.927	0.49731	112.131	0.56886 ± 0.84647	1.27098 ± 0.27092	4.89435 ± 1.1582	2.57538 ± 0.76001
WELBY	12/19/96	12	6	26.4968 ± 1.43921	0.93103	0.42077	94.2949	1.55465 ± 1.13539	0.9563 ± 0.27561	4.34489 ± 1.16172	2.92443 ± 0.89011
WELBY	12/19/96	18	12	12.9645 ± 0.70686	0.87751	0.8296	98.3231	2.50403 ± 1.15552	1.11801 ± 0.25328	-0.77717 ± 1.69451	1.71225 ± 0.83836
WELBY	12/20/96	06	6	16.8611 ± 1.02266	0.89281	0.57922	107.337	5.71247 ± 2.10282	1.57306 ± 0.3958	-1.18681 ± 2.27741	2.40818 ± 1.55341
WELBY	12/25/96	06	6	6.1808 ± 0.64267	0.93949	0.28542	105.787	0.01887 ± 0.27717	0.1947 ± 0.07088	2.3364 ± 0.802	1.02581 ± 0.35426
WELBY	12/25/96	12	6	3.6389 ± 0.60717	0.86983	0.39052	123.483	-0.11048 ± 0.2491	0.18913 ± 0.06711	2.10679 ± 0.61755	0.27802 ± 0.31978
WELBY	12/25/96	18	12	9.7327 ± 0.56444	0.96283	0.1544	91.588	-0.17492 ± 0.20248	0.01853 ± 0.051	0.87362 ± 0.33524	0.41217 ± 0.18566
WELBY	12/30/96	06	6	6.8973 ± 0.65334	0.82721	0.7915	135.081	1.43555 ± 0.97194	1.06784 ± 0.23103	0.87975 ± 1.1938	1.43069 ± 0.68455
WELBY	12/30/96	12	6	13.1441 ± 0.86106	0.89613	0.48401	115.822	2.39862 ± 1.12785	0.52537 ± 0.20343	1.45357 ± 1.16773	3.25423 ± 0.94434
WELBY	12/30/96	18	12	13.0844 ± 0.71154	0.93275	0.40653	102.551	2.34205 ± 0.89092	0.28242 ± 0.1452	2.98124 ± 0.97507	2.55458 ± 0.77184
WELBY	12/31/96	06	6	19.9007 ± 1.1376	0.92342	0.38811	103.39	-0.39322 ± 0.47215	0.11453 ± 0.11014	4.068 ± 1.06888	5.08941 ± 0.92311
WELBY	12/31/96	12	6	9.5533 ± 0.72853	0.86193	0.65173	122.643	2.48775 ± 1.07087	0.4082 ± 0.18264	1.9874 ± 1.05578	1.16569 ± 0.74271
WELBY	12/31/96	18	12	15.3952 ± 0.81802	0.84326	0.98928	102.979	3.62027 ± 1.16771	0.15954 ± 0.17843	-99 ± 0	1.98382 ± 0.98845
WELBY	01/01/97	06	6	7.4227 ± 0.67048	0.80837	0.87535	116.785	3.86957 ± 1.39611	1.02196 ± 0.27903	-99 ± 0	-0.70103 ± 1.07571
WELBY	01/01/97	12	6	15.3916 ± 0.93678	0.91336	0.48448	110.43	3.57301 ± 1.62857	1.09063 ± 0.31022	0.29606 ± 1.88438	0.8125 ± 1.07489
WELBY	01/01/97	18	12	11.5964 ± 0.64297	0.86078	1.07183	111.064	-99 ± 0	1.29025 ± 0.21642	0.34063 ± 1.35434	2.13975 ± 0.71142
WELBY	01/02/97	06	6	25.848 ± 1.39794	0.94831	0.30692	109.491	6.0013 ± 2.18326	1.39023 ± 0.42257	-99 ± 0	5.77553 ± 1.9368
WELBY	01/02/97	12	6	12.7753 ± 0.82812	0.91639	0.45934	111.9	0.6787 ± 0.69284	0.6778 ± 0.17571	2.03841 ± 1.59696	2.38351 ± 0.63249
WELBY	01/02/97	18	12	11.9116 ± 0.65676	0.92603	0.43418	103.929	3.07319 ± 1.13527	0.89645 ± 0.22736	-99 ± 0	2.22384 ± 0.92637
WELBY	01/06/97	06	6	7.0245 ± 0.65103	0.9035	0.44255	97.7999	0.97312 ± 0.50647	0.12546 ± 0.10386	-99 ± 0	0.21094 ± 0.42291
WELBY	01/06/97	12	6	14.6543 ± 0.93958	0.93675	0.30957	83.4631	1.67939 ± 0.93739	0.1944 ± 0.15966	-1.34029 ± 1.73814	0.39714 ± 0.61221
WELBY	01/06/97	18	12	13.1262 ± 0.71345	0.91765	0.56058	98.0311	0.01148 ± 0.28374	0.06947 ± 0.06327	2.6213 ± 1.11839	2.26317 ± 0.44002
WELBY	01/07/97	06	6	28.9717 ± 1.55571	0.89877	0.59799	94.7872	4.82781 ± 2.20455	1.26702 ± 0.41943	1.86202 ± 1.9859	1.98453 ± 1.5164
WELBY	01/07/97	12	6	21.3522 ± 1.19035	0.90564	0.53508	98.332	0.47597 ± 0.53829	0.27917 ± 0.13763	2.67071 ± 0.97473	1.97193 ± 0.53964
WELBY	01/07/97	18	12	13.003 ± 0.70546	0.95372	0.26338	84.4171	2.00889 ± 0.94917	0.78748 ± 0.204	0.78241 ± 1.45768	0.07401 ± 0.60867
WELBY	01/08/97	06	6	18.9878 ± 1.09751	0.92051	0.48359	129.5	4.95391 ± 2.06172	0.96032 ± 0.36209	1.51559 ± 1.77969	2.7294 ± 1.49671
WELBY	01/12/97	06	6	4.2324 ± 0.62581	0.89251	0.43755	103.997	1.21521 ± 0.67929	0.76481 ± 0.17634	-99 ± 0	0.10552 ± 0.56952
WELBY	01/12/97	12	6	4.5288 ± 0.58957	0.90861	0.41414	89.8276	1.05671 ± 0.59506	0.35157 ± 0.11658	-0.03665 ± 0.65271	-0.08173 ± 0.44135
WELBY	01/12/97	18	12	10.5747 ± 0.5918	0.89666	0.68482	99.207	1.1961 ± 0.6028	0.16891 ± 0.10896	2.49914 ± 0.57469	0.66307 ± 0.42321
WELBY	01/13/97	06	6	12.2182 ± 0.81252	0.96316	0.19794	94.5547	0.38792 ± 0.61127	0.23201 ± 0.12676	4.43385 ± 2.63405	0.68381 ± 0.42157
WELBY	01/13/97	12	6	24.365 ± 1.33799	0.97159	0.14584	88.7075	-0.52227 ± 0.70164	-0.03898 ± 0.14594	3.63702 ± 3.08616	1.90806 ± 0.52805
WELBY	01/13/97	18	12	22.1533 ± 1.13726	0.96819	0.19145	90.2272	0.87892 ± 0.69	0.12894 ± 0.15252	4.2081 ± 0.77745	1.07594 ± 0.50704
WELBY	01/14/97	12	6	24.0964 ± 1.32303	0.97175	0.18661	96.2249	1.22512 ± 0.88601	0.3024 ± 0.18761	4.94368 ± 1.02195	1.97978 ± 0.69297
WELBY	01/14/97	18	12	19.1366 ± 0.9949	0.92315	0.47248	100.198	1.1113 ± 0.78391	0.16634 ± 0.16275	1.9576 ± 1.36537	0.99953 ± 0.94512

Table C.1A-1 (continued)
Contributions to $PM_{2.5}$ Mass at Core Sites for Individual Samples - NFRAQS Winter 1996/97, Extended Species CMB

Site ID	Date	Start Hour	Duration (hrs)	Meat Cooking	Wood Combustion (Softwood)	Wood Combustion (Hardwood)	Paved Road Dust	Ammonium Sulfate	Ammonium Nitrate	Coal-Fired Powerplant
WELBY	12/18/96	12	6	0.06397 ± 0.38792	0.10931 ± 0.10762	0.01533 ± 0.17774	0.52918 ± 0.24979	0.58447 ± 0.09148	1.17426 ± 0.13367	0.21978 ± 0.31714
WELBY	12/19/96	06	6	-99 ± 0	0.51505 ± 0.30076	0.17082 ± 0.35588	2.79766 ± 0.80693	2.16073 ± 0.29616	4.2949 ± 0.44145	0.14392 ± 0.67317
WELBY	12/19/96	12	6	-99 ± 0	0.05363 ± 0.22573	0.02845 ± 0.3326	2.55127 ± 0.82039	3.22561 ± 0.50626	9.92304 ± 0.937	-0.57713 ± 0.82739
WELBY	12/19/96	18	12	2.09329 ± 1.0348	0.03692 ± 0.12696	0.19157 ± 0.29171	1.52575 ± 0.45405	1.65901 ± 0.2073	2.93509 ± 0.2985	-0.25165 ± 0.40934
WELBY	12/20/96	06	6	0.412 ± 0.89483	0.1643 ± 0.34594	1.54549 ± 0.89511	4.15497 ± 1.12217	1.20903 ± 0.20437	2.39507 ± 0.2578	-0.28958 ± 0.74846
WELBY	12/25/96	06	6	-0.103 ± 0.40564	0.05938 ± 0.09898	-0.01419 ± 0.18398	0.78063 ± 0.31002	0.51001 ± 0.094	1.42961 ± 0.15271	0.30028 ± 0.3591
WELBY	12/25/96	12	6	-99 ± 0	0.08585 ± 0.12565	-0.07987 ± 0.31409	1.0586 ± 0.38331	0.26506 ± 0.07732	0.58796 ± 0.08774	0.11235 ± 0.43182
WELBY	12/25/96	18	12	-99 ± 0	0.07216 ± 0.11028	-0.02421 ± 0.19054	0.63522 ± 0.24749	2.33511 ± 0.30194	4.81253 ± 0.47395	-0.04622 ± 0.28778
WELBY	12/30/96	06	6	0.00545 ± 0.53946	0.26877 ± 0.21634	0.30937 ± 0.39044	2.3996 ± 0.66812	0.20671 ± 0.10249	0.89944 ± 0.1158	0.41373 ± 0.55444
WELBY	12/30/96	12	6	-99 ± 0	0.02045 ± 0.18584	0.48353 ± 0.38926	4.96836 ± 1.27789	0.62742 ± 0.14614	0.96632 ± 0.12946	0.52589 ± 0.72495
WELBY	12/30/96	18	12	-99 ± 0	0.32201 ± 0.18845	0.24104 ± 0.23969	2.61674 ± 0.74843	0.74951 ± 0.12068	1.39709 ± 0.15445	-0.06853 ± 0.52154
WELBY	12/31/96	06	6	-99 ± 0	0.12924 ± 0.19459	0.16014 ± 0.28772	4.88497 ± 1.26951	1.33653 ± 0.27476	4.16285 ± 0.42342	1.02293 ± 0.87348
WELBY	12/31/96	12	6	-99 ± 0	0.05438 ± 0.16444	0.50581 ± 0.3564	3.4098 ± 0.92477	0.57689 ± 0.12293	0.77176 ± 0.10574	0.3488 ± 0.61018
WELBY	12/31/96	18	12	1.34734 ± 1.00721	0.60804 ± 0.39293	2.58695 ± 0.80473	2.48697 ± 0.79718	0.7055 ± 0.16361	1.02864 ± 0.12288	1.32681 ± 0.58335
WELBY	01/01/97	06	6	-99 ± 0	0.52712 ± 0.36086	0.86091 ± 0.68798	0.93422 ± 0.44662	0.34806 ± 0.12718	1.16166 ± 0.13805	0.64612 ± 0.44947
WELBY	01/01/97	12	6	1.02187 ± 0.90726	-0.05798 ± 0.23466	0.70781 ± 0.58711	2.94441 ± 0.80326	0.77715 ± 0.15747	5.63377 ± 0.49626	0.19764 ± 0.61058
WELBY	01/01/97	18	12	-99 ± 0	1.57186 ± 0.49651	2.8824 ± 1.03021	2.35509 ± 0.56351	0.65949 ± 0.09885	1.45941 ± 0.15207	0.18054 ± 0.3435
WELBY	01/02/97	06	6	1.19855 ± 1.17998	0.44928 ± 0.44309	0.97425 ± 1.15001	6.51809 ± 1.6083	1.99304 ± 0.30398	2.92618 ± 0.3215	1.07475 ± 0.97383
WELBY	01/02/97	12	6	1.00559 ± 0.94836	0.06122 ± 0.14312	0.16847 ± 0.28308	4.82252 ± 1.16937	0.75622 ± 0.15054	1.01586 ± 0.13439	0.68724 ± 0.72131
WELBY	01/02/97	18	12	1.41664 ± 0.69829	0.39598 ± 0.23757	0.11974 ± 0.48055	2.09064 ± 0.59195	0.63774 ± 0.11562	1.17257 ± 0.13246	0.3528 ± 0.40327
WELBY	01/06/97	06	6	0.59863 ± 0.37114	0.55125 ± 0.20601	-0.08141 ± 0.19169	0.4847 ± 0.21988	0.79757 ± 0.11144	3.31826 ± 0.30198	-0.10856 ± 0.27308
WELBY	01/06/97	12	6	1.94991 ± 1.10016	0.25494 ± 0.21966	-0.00448 ± 0.27931	2.5228 ± 0.75413	1.70437 ± 0.22757	5.35272 ± 0.48957	-0.47995 ± 0.68091
WELBY	01/06/97	18	12	1.29243 ± 0.73062	0.01481 ± 0.09471	-0.02572 ± 0.1718	3.14299 ± 0.76442	1.21117 ± 0.16472	2.22473 ± 0.2307	0.04193 ± 0.49405
WELBY	01/07/97	06	6	-99 ± 0	0.72652 ± 0.49775	0.59242 ± 0.77425	11.4518 ± 2.53837	1.42028 ± 0.27325	3.24677 ± 0.34119	0.08226 ± 1.31489
WELBY	01/07/97	12	6	-99 ± 0	0.01993 ± 0.18464	0.06432 ± 0.30969	8.59922 ± 1.91987	1.04539 ± 0.22068	5.98038 ± 0.53791	-0.11098 ± 1.09508
WELBY	01/07/97	18	12	0.06754 ± 0.92361	0.04182 ± 0.11401	0.03596 ± 0.22314	3.26379 ± 0.75959	0.7962 ± 0.12629	3.26796 ± 0.29819	-0.1493 ± 0.45584
WELBY	01/08/97	06	6	-99 ± 0	0.04474 ± 0.31135	0.79683 ± 0.79975	3.17227 ± 0.91181	1.83232 ± 0.26309	8.59466 ± 0.7582	-0.01094 ± 0.74463
WELBY	01/12/97	06	6	-99 ± 0	0.14731 ± 0.14763	0.10004 ± 0.26477	0.35925 ± 0.19544	0.74649 ± 0.10268	0.9888 ± 0.12548	-0.02588 ± 0.2511
WELBY	01/12/97	12	6	-99 ± 0	0.17613 ± 0.14289	0.03202 ± 0.17901	0.39347 ± 0.19912	0.96429 ± 0.11935	1.45135 ± 0.15813	-0.23904 ± 0.26253
WELBY	01/12/97	18	12	-99 ± 0	0.06943 ± 0.11089	-0.00122 ± 0.10303	1.00765 ± 0.35524	1.41577 ± 0.18665	3.79967 ± 0.35759	-0.32769 ± 0.37044
WELBY	01/13/97	06	6	-1.48442 ± 1.91253	-0.01166 ± 0.12358	0.02278 ± 0.21481	0.65936 ± 0.3425	1.87841 ± 0.26183	4.92402 ± 0.47699	-0.1732 ± 0.41632
WELBY	01/13/97	12	6	1.06593 ± 2.26763	0.10792 ± 0.20793	0.02221 ± 0.26119	1.15583 ± 0.4878	4.33843 ± 0.58123	10.0875 ± 0.97623	-0.14809 ± 0.5836
WELBY	01/13/97	18	12	-99 ± 0	0.45879 ± 0.276	0.00222 ± 0.27452	0.86768 ± 0.37517	2.93957 ± 0.45682	9.88527 ± 0.91604	-0.45713 ± 0.45113
WELBY	01/14/97	12	6	-99 ± 0	0.03018 ± 0.21265	0.05107 ± 0.35168	1.04417 ± 0.47155	6.10751 ± 0.6527	7.86381 ± 0.81322	-0.36097 ± 0.57669
WELBY	01/14/97	18	12	-99 ± 0	2.98941 ± 0.89976	0.26795 ± 0.44745	1.06825 ± 0.39294	5.63835 ± 0.57441	5.46311 ± 0.59393	-0.48736 ± 0.43374

Table C.1A-1 (continued)

Contributions to $PM_{2.5}$ Mass at Core Sites for Individual Samples - NFRAQS Winter 1996/97, Extended Species CMB

Site ID	Date	Start Hour	Duration (hrs)	$PM_{2.5}$ ($\mu g/m^3$)	R-square	Chi-square	Percent of Mass	Incremental cold start ("puffers")	Hot stabilized, non-smoking	Smoking LDGV exhaust	Diesel Exhaust
WELBY	01/15/97	06	6	7.8863 ± 0.67002	0.94173	0.33316	99.2222	0.4123 ± 0.51681	0.39324 ± 0.12317	3.30463 ± 1.76354	1.10221 ± 0.42612
WELBY	01/15/97	12	6	6.23 ± 0.62935	0.96084	0.18988	123.885	-0.48854 ± 0.42008	0.24045 ± 0.09686	3.29668 ± 0.66406	1.20841 ± 0.40778
WELBY	01/15/97	18	12	5.3762 ± 0.38203	0.94194	0.35036	112.472	1.38222 ± 0.65777	0.48268 ± 0.13189	0.54773 ± 0.94687	-0.22385 ± 0.42261
WELBY	01/16/97	06	6	10.1421 ± 0.74209	0.96029	0.21541	102.041	-0.21913 ± 0.42607	0.09169 ± 0.09023	4.02671 ± 1.67537	1.35278 ± 0.41988
WELBY	01/16/97	12	6	12.6672 ± 0.83432	0.95238	0.23834	100.645	-0.6319 ± 0.52309	0.08483 ± 0.10592	3.90912 ± 1.07803	0.98452 ± 0.43056
WELBY	01/16/97	18	12	27.4375 ± 1.39543	0.9608	0.23393	95.0494	-0.56586 ± 0.6616	0.04261 ± 0.15115	7.21878 ± 1.59318	4.04074 ± 0.81643
WELBY	01/17/97	06	6	53.0803 ± 2.70112	0.95678	0.31214	92.9989	3.87275 ± 2.17037	0.83942 ± 0.41323	7.91087 ± 3.75529	7.28456 ± 1.89606
WELBY	01/17/97	12	6	21.8331 ± 1.21598	0.97467	0.13371	100.367	1.54606 ± 1.06493	0.56353 ± 0.22236	1.92458 ± 1.65366	1.54116 ± 0.71289
WELBY	01/17/97	18	12	26.2622 ± 1.33924	0.92174	0.41368	90.7253	-1.05547 ± 0.81729	-0.1674 ± 0.17259	7.39439 ± 1.63348	4.46551 ± 0.90079
WELBY	01/18/97	06	6	17.4847 ± 1.0109	0.88225	0.71666	101.6	2.88058 ± 1.54702	1.31919 ± 0.32625	1.74854 ± 1.92509	1.68753 ± 1.041
WELBY	01/18/97	12	6	18.5801 ± 1.06324	0.92851	0.44392	106.712	2.20298 ± 1.27471	0.95681 ± 0.26843	1.45336 ± 2.14077	2.61742 ± 0.94235
WELBY	01/18/97	18	12	15.8248 ± 0.831	0.9265	0.40892	87.0254	4.64776 ± 1.52638	0.71141 ± 0.24968	-0.90031 ± 1.96429	0.3218 ± 1.13536
WELBY	01/19/97	06	6	10.9238 ± 0.77901	0.93111	0.398	109.711	1.78304 ± 0.87941	0.36573 ± 0.15418	3.53367 ± 1.19586	0.73764 ± 0.62742
WELBY	01/19/97	12	6	5.7492 ± 0.60871	0.8556	0.75814	161.401	0.57393 ± 0.60972	0.81124 ± 0.17477	4.57067 ± 0.84126	0.40309 ± 0.4519
WELBY	01/19/97	18	12	15.1168 ± 0.80093	0.93462	0.31834	97.0529	5.0891 ± 1.51816	0.62135 ± 0.23622	0.01935 ± 2.1522	1.24452 ± 1.17906
WELBY	01/20/97	06	6	19.0674 ± 1.09316	0.86794	0.62028	96.7564	6.10955 ± 2.0112	0.82715 ± 0.31171	1.25923 ± 2.15601	2.34399 ± 1.5469
WELBY	01/20/97	12	6	10.1111 ± 0.74659	0.91992	0.45569	120.114	1.22249 ± 0.73855	0.5654 ± 0.16	3.47033 ± 0.88711	1.75478 ± 0.60166
WELBY	01/20/97	18	12	7.0862 ± 0.44626	0.91287	0.44615	145.254	4.03198 ± 1.27895	0.49134 ± 0.19905	-0.07174 ± 1.1737	0.94869 ± 0.97406
WELBY	01/27/97	06	6	17.3017 ± 1.02116	0.92769	0.38307	81.1228	4.25165 ± 1.60556	0.5196 ± 0.25927	0.40625 ± 1.3328	-0.69812 ± 1.11301
WELBY	01/27/97	12	6	10.217 ± 0.75011	0.9747	0.13531	91.3311	0.225 ± 0.27928	0.0149 ± 0.06612	2.26733 ± 0.56985	0.91324 ± 0.33605
WELBY	01/27/97	18	12	13.247 ± 0.71565	0.94889	0.30045	98.213	1.38522 ± 0.69054	-0.11575 ± 0.12231	2.34289 ± 0.66532	1.45008 ± 0.53234
WELBY	01/28/97	06	6	21.1324 ± 1.18467	0.91079	0.418	89.1911	0.08638 ± 0.3738	0.05204 ± 0.0955	3.15202 ± 0.96573	2.8955 ± 0.61004
WELBY	01/28/97	12	6	36.1408 ± 1.85737	0.95414	0.23169	78.7171	2.52268 ± 1.38513	0.26772 ± 0.25392	2.19388 ± 1.43497	2.56903 ± 1.00666
WELBY	01/28/97	18	12	14.481 ± 0.77105	0.97067	0.1569	100.184	2.6979 ± 1.04969	0.13511 ± 0.17038	1.7261 ± 0.94154	0.65862 ± 0.74004
WELBY	01/29/97	06	6	16.2101 ± 0.97662	0.96425	0.21505	94.574	0.95461 ± 0.63398	0.18348 ± 0.12856	2.91975 ± 0.786	1.98474 ± 0.57616
WELBY	01/29/97	12	6	6.8276 ± 0.64517	0.97446	0.12382	123.225	0.52557 ± 0.38243	-0.06994 ± 0.07712	1.93666 ± 0.57477	0.53286 ± 0.33739
WELBY	01/29/97	18	12	8.4375 ± 0.49725	0.93998	0.36747	87.8062	1.42767 ± 0.55656	0.09142 ± 0.08802	1.35208 ± 0.77949	0.92027 ± 0.43985
WELBY	01/30/97	06	6	21.2569 ± 1.18165	0.78205	0.98648	105.349	5.60778 ± 2.12237	0.86967 ± 0.37374	-0.45365 ± 2.77596	3.02545 ± 1.5992
WELBY	01/30/97	12	6	3.9998 ± 0.59509	0.90064	0.34547	182.476	-0.00742 ± 0.38029	0.46553 ± 0.11332	2.53336 ± 1.28409	1.02951 ± 0.37257
WELBY	01/30/97	18	12	1.6862 ± 0.29092	0.87477	0.46159	169.321	0.03792 ± 0.19021	0.27305 ± 0.06037	1.05803 ± 0.62414	0.20306 ± 0.1637

Table C.1A-1 (continued)

Contributions to $PM_{2.5}$ Mass at Core Sites for Individual Samples - NFRAQS Winter 1996/97, Extended Species CMB

Site ID	Date	Start Hour	Duration (hrs)	Meat Cooking	Wood Combustion (Softwood)	Wood Combustion (Hardwood)	Paved Road Dust	Ammonium Sulfate	Ammonium Nitrate	Coal-Fired Powerplant
WELBY	01/15/97	06	6	-0.99096 ± 1.22432	-0.00551 ± 0.09647	0.02332 ± 0.19378	0.88531 ± 0.37282	1.42472 ± 0.1604	1.29591 ± 0.15161	-0.02023 ± 0.44041
WELBY	01/15/97	12	6	-99 ± 0	0.01955 ± 0.0868	-0.00108 ± 0.13929	0.55429 ± 0.28329	1.3026 ± 0.15127	1.50687 ± 0.16928	0.07882 ± 0.35833
WELBY	01/15/97	18	12	0.072 ± 0.58618	0.08448 ± 0.09469	0.07462 ± 0.16849	0.53267 ± 0.21419	1.78329 ± 0.17616	1.34521 ± 0.14961	-0.03433 ± 0.25347
WELBY	01/16/97	06	6	-0.94848 ± 1.17999	-0.00479 ± 0.10746	0.01347 ± 0.22273	1.56583 ± 0.5474	2.09875 ± 0.23183	2.3156 ± 0.2507	0.05662 ± 0.59465
WELBY	01/16/97	12	6	-0.15302 ± 0.56493	0.04186 ± 0.11751	-0.01491 ± 0.16879	4.05248 ± 1.03825	1.79047 ± 0.22086	2.43506 ± 0.26309	0.25033 ± 0.72072
WELBY	01/16/97	18	12	-0.20605 ± 0.87041	-0.02887 ± 0.17003	-0.02128 ± 0.24873	5.13403 ± 1.32409	3.34423 ± 0.42108	7.26633 ± 0.70839	-0.1455 ± 0.9132
WELBY	01/17/97	06	6	2.13924 ± 2.05924	0.08565 ± 0.46933	1.11345 ± 1.23722	5.6159 ± 1.59738	6.83565 ± 0.83169	13.6925 ± 1.33893	-0.0259 ± 1.23663
WELBY	01/17/97	12	6	0.63182 ± 0.97253	0.02978 ± 0.2305	-0.04189 ± 0.35277	2.22318 ± 0.70878	2.72773 ± 0.46287	11.0611 ± 1.0002	-0.29382 ± 0.73529
WELBY	01/17/97	18	12	-0.55636 ± 0.90428	-0.01879 ± 0.16874	-0.02866 ± 0.20561	3.73994 ± 1.05103	2.2988 ± 0.33379	8.11577 ± 0.75025	-0.36127 ± 0.82425
WELBY	01/18/97	06	6	0.96177 ± 0.91838	0.2609 ± 0.28257	0.06476 ± 0.70922	4.65151 ± 1.19793	0.66469 ± 0.16474	3.58243 ± 0.33511	-0.05743 ± 0.85184
WELBY	01/18/97	12	6	1.4928 ± 1.21857	-0.04949 ± 0.24216	0.68971 ± 0.73495	3.56184 ± 0.9161	0.74648 ± 0.15192	6.40251 ± 0.55508	-0.24729 ± 0.66783
WELBY	01/18/97	18	12	1.79848 ± 1.00181	0.86636 ± 0.32021	1.18398 ± 0.62774	0.89733 ± 0.34302	0.55303 ± 0.12791	3.49291 ± 0.3202	0.19886 ± 0.3696
WELBY	01/19/97	06	6	0.49338 ± 0.50832	0.15635 ± 0.14965	-0.00474 ± 0.20176	1.8261 ± 0.63339	0.59295 ± 0.12422	2.1331 ± 0.21871	0.36733 ± 0.55584
WELBY	01/19/97	12	6	-99 ± 0	-0.0063 ± 0.09922	0.06104 ± 0.24357	0.90478 ± 0.46044	0.39992 ± 0.10515	1.16723 ± 0.16895	0.39368 ± 0.51928
WELBY	01/19/97	18	12	2.59759 ± 1.18516	0.18309 ± 0.23462	0.95909 ± 0.62587	2.05799 ± 0.61572	0.35927 ± 0.12227	1.45463 ± 0.15725	0.08533 ± 0.45462
WELBY	01/20/97	06	6	0.08145 ± 0.77021	0.07897 ± 0.24054	0.4809 ± 0.67378	3.42928 ± 1.04196	0.51311 ± 0.20752	2.23279 ± 0.25329	1.0925 ± 0.77587
WELBY	01/20/97	12	6	-99 ± 0	0.01279 ± 0.10271	0.02122 ± 0.20679	2.29255 ± 0.72604	0.52188 ± 0.13026	1.69684 ± 0.18283	0.58655 ± 0.59518
WELBY	01/20/97	18	12	-99 ± 0	-0.01756 ± 0.17962	0.68652 ± 0.513	0.81001 ± 0.32398	0.74783 ± 0.12861	2.82515 ± 0.27019	-0.15922 ± 0.35067
WELBY	01/27/97	06	6	-99 ± 0	0.37394 ± 0.27647	0.0969 ± 0.40687	1.82612 ± 0.63059	2.56933 ± 0.33413	4.95336 ± 0.49873	-0.26341 ± 0.62169
WELBY	01/27/97	12	6	-99 ± 0	-0.03819 ± 0.08847	0.01614 ± 0.1508	0.54772 ± 0.3093	2.01198 ± 0.22673	3.41503 ± 0.34144	-0.04186 ± 0.36807
WELBY	01/27/97	18	12	-99 ± 0	0.15008 ± 0.14442	0.05218 ± 0.19668	1.12018 ± 0.42227	2.15209 ± 0.25886	4.85365 ± 0.46062	-0.38034 ± 0.41848
WELBY	01/28/97	06	6	-99 ± 0	-0.0838 ± 0.14861	0.00215 ± 0.24397	8.88367 ± 2.06158	0.64263 ± 0.21417	2.12558 ± 0.23251	1.09205 ± 1.13187
WELBY	01/28/97	12	6	-99 ± 0	-0.08157 ± 0.2689	0.01541 ± 0.38276	13.032 ± 2.77568	1.20136 ± 0.30015	6.09718 ± 0.58463	0.63126 ± 1.45267
WELBY	01/28/97	18	12	-99 ± 0	-0.00501 ± 0.13329	0.0263 ± 0.26052	4.79181 ± 1.15457	1.22649 ± 0.18022	3.17869 ± 0.32211	0.07157 ± 0.65068
WELBY	01/29/97	06	6	-99 ± 0	-0.05069 ± 0.14126	0.02762 ± 0.2389	0.87684 ± 0.41932	2.0052 ± 0.24725	6.30332 ± 0.60606	0.12567 ± 0.48111
WELBY	01/29/97	12	6	-99 ± 0	-0.02904 ± 0.08885	-0.00097 ± 0.13701	0.97119 ± 0.41065	1.75205 ± 0.20143	2.69458 ± 0.2753	0.10034 ± 0.46177
WELBY	01/29/97	18	12	0.08873 ± 0.4249	0.03685 ± 0.0637	0.00516 ± 0.10506	0.85551 ± 0.31082	1.09503 ± 0.12643	1.3607 ± 0.14323	0.17524 ± 0.28842
WELBY	01/30/97	06	6	0.78894 ± 1.52975	0.0668 ± 0.32022	1.13769 ± 0.76007	8.25721 ± 1.89763	0.69288 ± 0.22105	1.5637 ± 0.25527	0.83752 ± 1.03369
WELBY	01/30/97	12	6	0.62731 ± 0.82377	-0.00234 ± 0.08207	0.06428 ± 0.14559	1.63922 ± 0.57791	0.1344 ± 0.0979	0.30507 ± 0.07157	0.50973 ± 0.58402
WELBY	01/30/97	18	12	0.50223 ± 0.40046	-0.02004 ± 0.03523	0.02784 ± 0.06468	0.46429 ± 0.19727	0.17554 ± 0.03873	0.08968 ± 0.03194	0.04348 ± 0.21704

Table C.1A-2
Contributions to Total Carbon at Core Sites for Individual Samples - NFRAQS Winter 1996/97, Extended Species CMB

Site ID	Date	Start Hour	Duration (hrs)	Total Carbon (µg/m^3)	R-square	Chi-square	Percent of Mass	Incremental cold start ("puffers")	Hot stabilized, non-smoking	Smoking LDGV exhaust	Diesel Exhaust
BRIGHT	12/18/96	06	6	3.9566 ± 0.45485	0.94696	0.24884	107.156	-0.26114 ± 0.02268	0.05309 ± 0.00346	3.31836 ± 0.13481	1.32755 ± 0.05262
BRIGHT	12/18/96	12	6	1.3562 ± 0.44116	0.86814	0.4292	67.2689	-0.0813 ± 0.00706	0.0608 ± 0.00396	1.64269 ± 0.06674	0.27016 ± 0.01071
BRIGHT	12/18/96	18	12	4.1775 ± 0.33076	0.91877	0.55765	174.449	0.14 ± 0.01216	0.09808 ± 0.00639	2.17603 ± 0.0884	1.63167 ± 0.06467
BRIGHT	12/19/96	06	6	6.8745 ± 0.60979	0.90093	0.71493	97.5913	0.82951 ± 0.07206	0.30665 ± 0.01999	4.14787 ± 0.16851	1.27132 ± 0.05039
BRIGHT	12/19/96	12	6	9.1949 ± 0.71146	0.95264	0.28973	87.797	1.3831 ± 0.12014	0.4982 ± 0.03247	4.1514 ± 0.16865	2.44842 ± 0.09705
BRIGHT	12/19/96	18	12	2.6661 ± 0.26227	0.95264	0.27804	97.5091	0.33737 ± 0.02931	0.22081 ± 0.01439	1.14859 ± 0.04666	0.79052 ± 0.03133
BRIGHT	12/20/96	06	6	2.9639 ± 0.43964	0.94627	0.1404	98.4816	-0.36621 ± 0.03181	0.02371 ± 0.00155	1.79819 ± 0.07305	1.2115 ± 0.04802
BRIGHT	12/25/96	06	6	1.551 ± 0.42493	0.82737	0.3782	122.389	0.0162 ± 0.00141	0.1258 ± 0.0082	1.44907 ± 0.05887	0.28238 ± 0.01119
BRIGHT	12/25/96	12	6	0.8501 ± 0.47119	0.86192	0.49436	116.647	-0.05926 ± 0.00515	0.06718 ± 0.00438	1.16998 ± 0.04753	0.09683 ± 0.00384
BRIGHT	12/25/96	18	12	0.5435 ± 0.237	0.90966	0.38346	111.531	0.04723 ± 0.0041	0.00345 ± 0.00023	0.26549 ± 0.01079	0.21827 ± 0.00865
BRIGHT	12/26/96	06	6	2.0619 ± 0.42219	0.95011	0.23806	85.5113	0.08884 ± 0.00772	0.0094 ± 0.00061	1.46021 ± 0.05932	0.4826 ± 0.01913
BRIGHT	12/26/96	12	6	1.7049 ± 0.44684	0.91168	0.4276	114.996	0.17105 ± 0.01486	0.06934 ± 0.00452	0.07958 ± 0.00323	0.36044 ± 0.01429
BRIGHT	12/26/96	18	12	1.3531 ± 0.21879	0.94882	0.26857	120.921	0.20171 ± 0.01752	0.08422 ± 0.00549	0.53879 ± 0.02189	0.39997 ± 0.01585
BRIGHT	12/30/96	06	6	3.0727 ± 0.44718	0.90027	0.34308	107.852	0.07666 ± 0.00666	0.29215 ± 0.01904	0.56141 ± 0.02281	1.01097 ± 0.04007
BRIGHT	12/30/96	12	6	1.9395 ± 0.4822	0.8281	0.45871	97.5083	-0.15913 ± 0.01382	0.30994 ± 0.0202	0.6106 ± 0.02481	1.11539 ± 0.04421
BRIGHT	12/30/96	18	12	2.1447 ± 0.24192	0.91522	0.48103	109.215	0.30823 ± 0.02677	0.11136 ± 0.00726	0.54844 ± 0.02228	0.80446 ± 0.03189
BRIGHT	12/31/96	06	6	5.051 ± 0.51852	0.95116	0.21564	108.314	-0.42231 ± 0.03668	0.01355 ± 0.00088	3.14334 ± 0.1277	2.28972 ± 0.09076
BRIGHT	12/31/96	12	6	3.4542 ± 0.45023	0.92289	0.39994	134.718	0.08235 ± 0.00715	0.09339 ± 0.00609	1.44635 ± 0.05876	1.54398 ± 0.0612
BRIGHT	12/31/96	18	12	3.0172 ± 0.27659	0.88751	0.5466	117.748	0.4607 ± 0.04002	0.10004 ± 0.00652	1.27827 ± 0.05193	0.84542 ± 0.03351
BRIGHT	01/01/97	06	6	1.5819 ± 0.42952	0.89792	0.39318	113.824	0.65313 ± 0.05673	0.13698 ± 0.00893	0.76293 ± 0.03099	-0.07416 ± 0.00294
BRIGHT	01/01/97	12	6	5.0503 ± 0.51648	0.87896	0.65062	134.745	0.46828 ± 0.04068	0.06173 ± 0.00402	2.72626 ± 0.11076	1.39395 ± 0.05525
BRIGHT	01/01/97	18	12	2.5913 ± 0.26068	0.92624	0.41979	127.122	0.15823 ± 0.01374	0.1054 ± 0.00687	1.57731 ± 0.06408	0.79885 ± 0.03166
BRIGHT	01/02/97	06	6	4.2212 ± 0.48652	0.90415	0.30344	110.666	0.29778 ± 0.02587	0.21121 ± 0.01377	2.18848 ± 0.08891	1.35565 ± 0.05373
BRIGHT	01/02/97	12	6	3.7125 ± 0.46822	0.88166	0.41006	142.416	-0.11019 ± 0.00957	0.27705 ± 0.01806	2.09585 ± 0.08515	0.99652 ± 0.0395
BRIGHT	01/02/97	18	12	2.926 ± 0.27171	0.94117	0.30128	156.115	0.50091 ± 0.04351	0.10453 ± 0.00681	1.33883 ± 0.05439	1.00862 ± 0.03998
BRIGHT	01/06/97	06	6	1.2373 ± 0.48245	0.91285	0.28958	109.72	-99 ± -99	0.37039 ± 0.02414	0.21299 ± 0.00865	0.13302 ± 0.00527
BRIGHT	01/06/97	12	6	2.0048 ± 0.4115	0.97759	0.08534	110.339	-0.29741 ± 0.02583	0.02196 ± 0.00143	1.47981 ± 0.06012	0.93679 ± 0.03713
BRIGHT	01/06/97	18	12	2.8672 ± 0.26739	0.947	0.30669	96.1483	-0.05083 ± 0.00442	0.04286 ± 0.00279	1.67345 ± 0.06799	1.26912 ± 0.0503
BRIGHT	01/07/97	06	6	5.5283 ± 0.53292	0.9656	0.15628	103.44	-0.51871 ± 0.04506	-0.06083 ± 0.00396	3.02051 ± 0.12271	2.53313 ± 0.1004
BRIGHT	01/07/97	12	6	4.5374 ± 0.4941	0.9621	0.19814	102.617	-0.00497 ± 0.00043	0.07506 ± 0.00489	2.50172 ± 0.10163	2.10919 ± 0.0836
BRIGHT	01/07/97	18	12	1.2083 ± 0.21323	0.95963	0.20596	107.482	0.05168 ± 0.00449	0.13278 ± 0.00865	0.58796 ± 0.02389	0.24581 ± 0.00974
BRIGHT	01/08/97	06	6	4.9862 ± 0.51454	0.97186	0.13964	93.4303	0.84934 ± 0.07378	0.02494 ± 0.00163	2.43207 ± 0.0988	1.52029 ± 0.06026
BRIGHT	01/12/97	06	6	0.2396 ± 0.423	0.8585	0.32911	59.4525	-0.14072 ± 0.01222	0.04222 ± 0.00275	0.56869 ± 0.0231	0.15904 ± 0.0063
BRIGHT	01/12/97	12	6	0.9327 ± 0.45498	0.9147	0.2786	83.8301	-0.15704 ± 0.01364	0.03841 ± 0.0025	0.8748 ± 0.03554	0.2189 ± 0.00868
BRIGHT	01/12/97	18	12	3.5986 ± 0.31103	0.88073	0.6962	91.9326	-0.02876 ± 0.0025	0.00806 ± 0.00053	2.2819 ± 0.0927	0.89749 ± 0.03557

Table C.1A-2 (continued)
Contributions to Total Carbon at Core Sites for Individual Samples - NFRAQS Winter 1996/97, Extended Species CMB

Site ID	Date	Start Hour	Duration (hrs)	Meat Cooking	Wood Combustion (Softwood)	Wood Combustion (Hardwood)	Paved Road Dust	Ammonium Sulfate	Ammonium Nitrate	Coal-Fired Powerplant
BRIGHT	12/18/96	06	6	-0.52762 ± 0.04177	0.02243 ± 0.0074	-0.01573 ± 0.00074	0.08229 ± 0.02618	0 ± 0.00015	0 ± 0.00023	0.0011 ± 0.0011
BRIGHT	12/18/96	12	6	-0.3101 ± 0.02455	0.01357 ± 0.00447	-0.04728 ± 0.00222	0.1434 ± 0.04562	0 ± 0.00009	0 ± 0.00009	0.0213 ± 0.02121
BRIGHT	12/18/96	18	12	-99 ± -99	0.07425 ± 0.02448	0.04022 ± 0.00189	0.04896 ± 0.01557	0 ± 0.00018	0 ± 0.00021	-0.00534 ± 0.00531
BRIGHT	12/19/96	06	6	-0.27439 ± 0.02172	0.47182 ± 0.15556	0.07925 ± 0.00372	0.11861 ± 0.03773	0 ± 0.00031	0 ± 0.00055	-0.00703 ± 0.007
BRIGHT	12/19/96	12	6	-99 ± -99	0.10804 ± 0.03562	0.45553 ± 0.02141	0.2065 ± 0.06569	0 ± 0.00049	0 ± 0.00155	-0.01772 ± 0.01764
BRIGHT	12/19/96	18	12	-99 ± -99	0.05393 ± 0.01778	0.01717 ± 0.00081	0.04443 ± 0.01413	0 ± 0.0001	0 ± 0.00022	-0.00664 ± 0.00661
BRIGHT	12/20/96	06	6	-99 ± -99	0.0108 ± 0.00356	-0.01246 ± 0.00059	0.06209 ± 0.01975	0 ± 0.00004	0 ± 0.00015	0.00413 ± 0.00412
BRIGHT	12/25/96	06	6	-0.13823 ± 0.01094	0.0705 ± 0.02324	-0.00288 ± 0.00014	0.06501 ± 0.02068	0 ± 0.00002	0 ± 0.00004	0.00401 ± 0.004
BRIGHT	12/25/96	12	6	-0.21282 ± 0.01685	0.0156 ± 0.00514	-0.01099 ± 0.00052	0.07269 ± 0.02312	0 ± 0.00006	0 ± 0.00017	0.0077 ± 0.00767
BRIGHT	12/25/96	18	12	-99 ± -99	0.01083 ± 0.00357	0.04518 ± 0.00212	0.04056 ± 0.0129	0 ± 0.00038	0 ± 0.0009	-0.00249 ± 0.00248
BRIGHT	12/26/96	06	6	-99 ± -99	0.03498 ± 0.01153	-0.03307 ± 0.00155	0.14095 ± 0.04484	0 ± 0.00045	0 ± 0.00093	0.00561 ± 0.00559
BRIGHT	12/26/96	12	6	0.62001 ± 0.04908	0.03365 ± 0.01109	0.13552 ± 0.00637	0.1827 ± 0.05812	0 ± 0.00039	0 ± 0.00088	0.00659 ± 0.00656
BRIGHT	12/26/96	18	12	-99 ± -99	0.01835 ± 0.00605	0.01414 ± 0.00066	0.10417 ± 0.03314	0 ± 0.00022	0 ± 0.0005	0.00635 ± 0.00632
BRIGHT	12/30/96	06	6	0.66632 ± 0.05275	0.00373 ± 0.00123	0.31 ± 0.01457	0.12002 ± 0.03818	0 ± 0.00006	0 ± 0.00005	0.01362 ± 0.01356
BRIGHT	12/30/96	12	6	-0.2828 ± 0.02239	-0.05064 ± 0.0167	0.24229 ± 0.01139	0.16583 ± 0.05275	0 ± 0.00007	0 ± 0.00003	0.00696 ± 0.00694
BRIGHT	12/30/96	18	12	-0.11633 ± 0.00921	0.11451 ± 0.03775	0.28942 ± 0.0136	0.09499 ± 0.03022	0 ± 0.00008	0 ± 0.00007	0.0039 ± 0.00389
BRIGHT	12/31/96	06	6	-0.38571 ± 0.03053	0.01223 ± 0.00403	-0.0122 ± 0.00057	0.23241 ± 0.07393	0 ± 0.00011	0 ± 0.00035	0.00627 ± 0.00625
BRIGHT	12/31/96	12	6	-99 ± -99	-0.00204 ± 0.00067	-0.00678 ± 0.00032	0.19068 ± 0.06066	0 ± 0.00011	0 ± 0.00042	0.01849 ± 0.01841
BRIGHT	12/31/96	18	12	-99 ± -99	0.05619 ± 0.01853	0.00947 ± 0.00045	0.13357 ± 0.04249	0 ± 0.00005	0 ± 0.00004	0.00616 ± 0.00613
BRIGHT	01/01/97	06	6	-99 ± -99	-99 ± -99	0.1049 ± 0.00493	0.11925 ± 0.03794	0 ± 0.00006	0 ± 0.0002	-0.00332 ± 0.00331
BRIGHT	01/01/97	12	6	-99 ± -99	-0.04449 ± 0.01467	0.02536 ± 0.00119	0.36189 ± 0.11512	0 ± 0.00018	0 ± 0.00096	-0.00978 ± 0.00974
BRIGHT	01/01/97	18	12	-0.25023 ± 0.01981	-0.01646 ± 0.00543	0.00366 ± 0.00017	0.16141 ± 0.05135	0 ± 0.00007	0 ± 0.00012	0.00293 ± 0.00292
BRIGHT	01/02/97	06	6	-0.20088 ± 0.0159	-0.0207 ± 0.00682	0.10101 ± 0.00475	0.26538 ± 0.08442	0 ± 0.00004	0 ± 0.00003	0.01412 ± 0.01406
BRIGHT	01/02/97	12	6	-99 ± -99	-0.02707 ± 0.00893	-0.00133 ± 0.00006	0.31355 ± 0.09974	0 ± 0.00006	0 ± 0.00007	0.00195 ± 0.00194
BRIGHT	01/02/97	18	12	-0.27909 ± 0.02209	0.00571 ± 0.00188	0.00142 ± 0.00007	0.17953 ± 0.05711	0 ± 0.00007	0 ± 0.00016	0.00188 ± 0.00187
BRIGHT	01/06/97	06	6	-99 ± -99	0.33124 ± 0.10921	0.145 ± 0.00682	0.02648 ± 0.00842	0 ± 0.00004	0 ± 0.00031	0.00168 ± 0.00167
BRIGHT	01/06/97	12	6	-0.24521 ± 0.01941	0.0029 ± 0.00096	-0.00428 ± 0.0002	0.02654 ± 0.00844	0 ± 0.0001	0 ± 0.0005	-0.00005 ± 0.00005
BRIGHT	01/06/97	18	12	-0.26364 ± 0.02087	-0.00221 ± 0.00073	0.05218 ± 0.00245	0.04803 ± 0.01528	0 ± 0.00015	0 ± 0.00038	-0.00202 ± 0.00201
BRIGHT	01/07/97	06	6	-99 ± -99	0.015 ± 0.00494	-0.01661 ± 0.00078	0.15603 ± 0.04963	0 ± 0.00014	0 ± 0.00056	0.00107 ± 0.00106
BRIGHT	01/07/97	12	6	-0.50088 ± 0.03965	-0.04624 ± 0.01525	0.02771 ± 0.0013	0.30773 ± 0.0979	0 ± 0.00017	0 ± 0.00103	0.01113 ± 0.01109
BRIGHT	01/07/97	18	12	-99 ± -99	-0.00465 ± 0.00153	0.04535 ± 0.00213	0.12915 ± 0.04108	0 ± 0.00011	0 ± 0.00028	-0.00008 ± 0.00008
BRIGHT	01/08/97	06	6	-99 ± -99	0.01279 ± 0.00422	-0.0082 ± 0.00039	0.07531 ± 0.02396	0 ± 0.00028	0 ± 0.00112	0.00543 ± 0.00541
BRIGHT	01/12/97	06	6	-0.2108 ± 0.01669	0.02648 ± 0.00873	0.02512 ± 0.00118	0.02537 ± 0.00807	0 ± 0.00012	0 ± 0.00005	-0.00176 ± 0.00175
BRIGHT	01/12/97	12	6	-99 ± -99	0.04409 ± 0.01454	-0.00245 ± 0.00012	0.04992 ± 0.01588	0 ± 0.00012	0 ± 0.00012	0.00321 ± 0.00319
BRIGHT	01/12/97	18	12	-99 ± -99	-0.00787 ± 0.00259	0.11508 ± 0.00541	0.20896 ± 0.06647	0 ± 0.00022	0 ± 0.00058	0.00621 ± 0.00618

Table C.1A-2 (continued)
Contributions to Total Carbon at Core Sites for Individual Samples - NFRAQS Winter 1996/97, Extended Species CMB

Site ID	Date	Start Hour	Duration (hrs)	Total Carbon (µg/m^3)	R-square	Chi-square	Percent of Mass	Incremental cold start ("puffers")	Hot stabilized, non-smoking	Smoking LDGV exhaust	Diesel Exhaust
BRIGHT	01/13/97	06	6	4.4796 ± 0.49597	0.96715	0.16167	104.478	-0.28616 ± 0.02486	-0.00119 ± 0.00008	3.31073 ± 0.1345	1.18046 ± 0.04679
BRIGHT	01/13/97	12	6	4.7409 ± 0.52427	0.96866	0.1359	83.0781	-0.54573 ± 0.0474	-0.04003 ± 0.00261	3.78739 ± 0.15387	1.19492 ± 0.04736
BRIGHT	01/13/97	18	12	5.83 ± 0.42805	0.95778	0.25771	90.2663	0.03884 ± 0.00337	0.06673 ± 0.00435	3.58954 ± 0.14583	1.71519 ± 0.06798
BRIGHT	01/14/97	06	6	8.3353 ± 0.68173	0.95196	0.28788	91.2966	0.8005 ± 0.06954	-0.04251 ± 0.00277	5.27564 ± 0.21433	1.73394 ± 0.06873
BRIGHT	01/14/97	12	6	3.532 ± 0.46916	0.96109	0.19749	69.8811	-0.26034 ± 0.02261	0.19302 ± 0.01258	2.85962 ± 0.11617	0.71652 ± 0.0284
BRIGHT	01/14/97	18	12	5.1257 ± 0.3854	0.95692	0.28384	97.1516	0.41538 ± 0.03608	0.13531 ± 0.00882	3.26413 ± 0.13261	1.34273 ± 0.05322
BRIGHT	01/15/97	06	6	2.5975 ± 0.42957	0.95308	0.22366	62.4223	-0.35199 ± 0.03058	0.15744 ± 0.01026	2.15257 ± 0.08745	0.72174 ± 0.02861
BRIGHT	01/15/97	12	6	1.6891 ± 0.4358	0.94333	0.28034	116.239	0.02437 ± 0.00212	0.09994 ± 0.00651	0.91303 ± 0.03709	0.38098 ± 0.0151
BRIGHT	01/15/97	18	12	1.1944 ± 0.22424	0.96899	0.13518	98.3563	-0.30279 ± 0.0263	0.07373 ± 0.00481	1.11233 ± 0.04519	0.25758 ± 0.01021
BRIGHT	01/16/97	06	6	2.7142 ± 0.43364	0.95821	0.20078	91.6799	-0.26601 ± 0.02311	0.08448 ± 0.00551	1.72119 ± 0.06992	1.04319 ± 0.04135
BRIGHT	01/16/97	12	6	2.7753 ± 0.45049	0.96945	0.13287	92.5676	-0.42794 ± 0.03717	-0.00432 ± 0.00028	2.35709 ± 0.09576	0.68481 ± 0.02714
BRIGHT	01/16/97	18	12	4.9798 ± 0.36647	0.91445	0.58308	89.7666	0.11458 ± 0.00995	-0.02484 ± 0.00162	2.71198 ± 0.11018	1.61682 ± 0.06408
BRIGHT	01/17/97	06	6	9.9658 ± 0.7558	0.93106	0.44455	95.7647	0.72873 ± 0.0633	0.13055 ± 0.00851	5.21682 ± 0.21194	3.21883 ± 0.12758
BRIGHT	01/17/97	12	6	6.8104 ± 0.58943	0.95877	0.23938	97.3321	1.19715 ± 0.10399	0.15527 ± 0.01012	1.47551 ± 0.05994	1.93933 ± 0.07687
BRIGHT	01/17/97	18	12	6.6308 ± 0.45719	0.93145	0.40475	88.3774	0.78363 ± 0.06807	0.01984 ± 0.00129	2.72203 ± 0.11058	2.5445 ± 0.10085
BRIGHT	01/18/97	06	6	5.1112 ± 0.52449	0.92153	0.37625	141.516	0.73209 ± 0.06359	0.20885 ± 0.01361	2.31119 ± 0.09389	1.37774 ± 0.05461
BRIGHT	01/18/97	12	6	3.4483 ± 0.45447	0.94237	0.24048	113.987	1.0181 ± 0.08844	0.02636 ± 0.00172	1.30987 ± 0.05321	0.85684 ± 0.03396
BRIGHT	01/18/97	18	12	3.552 ± 0.31119	0.92797	0.40816	101.699	0.30899 ± 0.02684	0.01149 ± 0.00075	1.83667 ± 0.07462	0.98146 ± 0.0389
BRIGHT	01/19/97	06	6	3.1036 ± 0.45269	0.93331	0.25646	157.052	-0.33808 ± 0.02937	0.07842 ± 0.00511	2.15968 ± 0.08774	0.95755 ± 0.03795
BRIGHT	01/19/97	12	6	3.4054 ± 0.47598	0.86155	0.43767	104.965	-0.15893 ± 0.01381	0.00888 ± 0.00058	3.04309 ± 0.12363	0.6143 ± 0.02435
BRIGHT	01/19/97	18	12	5.2544 ± 0.39299	0.96338	0.21055	90.0162	1.10558 ± 0.09604	0.12219 ± 0.00796	2.55403 ± 0.10376	1.20364 ± 0.04771
BRIGHT	01/20/97	06	6	6.4675 ± 0.57734	0.904	0.4892	93.451	0.07919 ± 0.00688	0.32884 ± 0.02143	3.16923 ± 0.12875	2.13049 ± 0.08444
BRIGHT	01/20/97	12	6	5.3239 ± 0.5367	0.90779	0.43139	128.735	-0.15678 ± 0.01362	0.1303 ± 0.00849	2.23371 ± 0.09075	2.63177 ± 0.10431
BRIGHT	01/27/97	06	6	1.5254 ± 0.42733	0.96685	0.13429	89.2059	-0.10593 ± 0.0092	-0.03679 ± 0.0024	0.97302 ± 0.03953	0.39639 ± 0.01571
BRIGHT	01/27/97	12	6	0.8811 ± 0.45174	0.92615	0.27244	94.4204	0.27196 ± 0.02362	-0.01787 ± 0.00116	-0.09769 ± 0.00397	0.18654 ± 0.00739
BRIGHT	01/27/97	18	12	3.6886 ± 0.30953	0.93919	0.35318	99.0156	0.72928 ± 0.06335	-0.00367 ± 0.00024	1.65797 ± 0.06736	1.03886 ± 0.04118
BRIGHT	01/28/97	12	6	5.7325 ± 0.53901	0.94523	0.28944	76.6791	1.52229 ± 0.13223	-0.08625 ± 0.00562	2.23489 ± 0.09079	1.55205 ± 0.06152
BRIGHT	01/28/97	18	12	1.1742 ± 0.21309	0.91035	0.48349	86.72	0.13121 ± 0.0114	0.11 ± 0.00717	0.43945 ± 0.01785	0.23646 ± 0.00937
BRIGHT	01/29/97	06	6	3.0367 ± 0.49301	0.95747	0.19574	102.231	1.69788 ± 0.14749	-0.10997 ± 0.00717	0.38047 ± 0.01546	-0.39313 ± 0.01558
BRIGHT	01/29/97	12	6	2.0228 ± 0.45004	0.92903	0.33933	114.113	0.62886 ± 0.05463	0.10516 ± 0.00685	0.18986 ± 0.00771	0.1826 ± 0.00724
BRIGHT	01/29/97	18	12	2.106 ± 0.24068	0.95258	0.23933	104.998	-0.04209 ± 0.00366	0.00716 ± 0.00047	1.20678 ± 0.04903	0.82126 ± 0.03255
BRIGHT	01/30/97	06	6	5.476 ± 0.5402	0.90171	0.48854	124.391	0.35344 ± 0.0307	0.08075 ± 0.00526	3.27237 ± 0.13294	1.48119 ± 0.05871
BRIGHT	01/30/97	12	6	2.1582 ± 0.50292	0.87866	0.24076	125.023	-0.17135 ± 0.01488	0.10436 ± 0.0068	1.59382 ± 0.06475	0.35753 ± 0.01417
BRIGHT	01/30/97	18	12	1.6501 ± 0.22633	0.89778	0.33437	155.019	-0.00882 ± 0.00077	0.05616 ± 0.00366	0.95936 ± 0.03897	0.52079 ± 0.02064

Table C.1A-2 (continued)
Contributions to Total Carbon at Core Sites for Individual Samples - NFRAQS Winter 1996/97, Extended Species CMB

Site ID	Date	Start Hour	Duration (hrs)	Meat Cooking	Wood Combustion (Softwood)	Wood Combustion (Hardwood)	Paved Road Dust	Ammonium Sulfate	Ammonium Nitrate	Coal-Fired Powerplant
BRIGHT	01/13/97	06	6	-99 ± -99	-0.02356 ± 0.00777	0.05224 ± 0.00246	0.09545 ± 0.03036	0 ± 0.00031	0 ± 0.00086	0.01342 ± 0.01336
BRIGHT	01/13/97	12	6	-99 ± -99	-0.00026 ± 0.00009	0.06854 ± 0.00322	0.14845 ± 0.04722	0 ± 0.00049	0 ± 0.00118	-0.00466 ± 0.00464
BRIGHT	01/13/97	18	12	-99 ± -99	0.01485 ± 0.0049	0.16865 ± 0.00793	0.12881 ± 0.04098	0 ± 0.00044	0 ± 0.00147	-0.00606 ± 0.00603
BRIGHT	01/14/97	06	6	-0.22463 ± 0.01778	0.0616 ± 0.02031	0.54685 ± 0.0257	0.17184 ± 0.05466	0 ± 0.0007	0 ± 0.00169	0.0004 ± 0.0004
BRIGHT	01/14/97	12	6	-0.16936 ± 0.01341	0.07836 ± 0.02583	-0.02512 ± 0.00118	0.04465 ± 0.0142	0 ± 0.00044	0 ± 0.00066	-0.00695 ± 0.00692
BRIGHT	01/14/97	18	12	-0.34807 ± 0.02755	0.10783 ± 0.03555	0.08261 ± 0.00388	0.0682 ± 0.02169	0 ± 0.00067	0 ± 0.00074	-0.01354 ± 0.01348
BRIGHT	01/15/97	06	6	-0.2905 ± 0.023	0.0213 ± 0.00702	0.0451 ± 0.00212	0.15258 ± 0.04854	0 ± 0.00026	0 ± 0.00023	0.00595 ± 0.00592
BRIGHT	01/15/97	12	6	0.2966 ± 0.02348	0.03528 ± 0.01163	-0.00104 ± 0.00005	0.04424 ± 0.01407	0 ± 0.00023	0 ± 0.0003	0.00271 ± 0.00269
BRIGHT	01/15/97	18	12	-0.06639 ± 0.00526	0.01663 ± 0.00548	-0.00686 ± 0.00032	0.0518 ± 0.01648	0 ± 0.00025	0 ± 0.00019	0.00671 ± 0.00668
BRIGHT	01/16/97	06	6	-99 ± -99	0.00925 ± 0.00305	0.00746 ± 0.00035	0.06241 ± 0.01985	0 ± 0.00023	0 ± 0.00033	0.01872 ± 0.01864
BRIGHT	01/16/97	12	6	-0.12971 ± 0.01027	0.04719 ± 0.01556	0.02923 ± 0.00137	0.10734 ± 0.03415	0 ± 0.00028	0 ± 0.00031	0.00006 ± 0.00006
BRIGHT	01/16/97	18	12	-99 ± -99	0.17642 ± 0.05817	0.12337 ± 0.0058	0.17065 ± 0.05429	0 ± 0.00039	0 ± 0.00083	0.01126 ± 0.01121
BRIGHT	01/17/97	06	6	-99 ± -99	0.07612 ± 0.0251	0.32387 ± 0.01522	0.23354 ± 0.07429	0 ± 0.00075	0 ± 0.00163	-0.00299 ± 0.00297
BRIGHT	01/17/97	12	6	1.58195 ± 0.12523	0.33379 ± 0.11005	0.15563 ± 0.00731	0.12865 ± 0.04093	0 ± 0.00056	0 ± 0.00237	-0.00386 ± 0.00384
BRIGHT	01/17/97	18	12	-99 ± -99	0.00191 ± 0.00063	0.15217 ± 0.00715	0.27006 ± 0.08591	0 ± 0.00036	0 ± 0.00124	-0.01713 ± 0.01705
BRIGHT	01/18/97	06	6	-99 ± -99	0.05011 ± 0.01652	0.10874 ± 0.00511	0.07906 ± 0.02515	0 ± 0.00005	0 ± 0.00024	-0.00321 ± 0.00319
BRIGHT	01/18/97	12	6	-99 ± -99	-0.00413 ± 0.00136	0.07813 ± 0.00367	0.05911 ± 0.01881	0 ± 0.00006	0 ± 0.00048	0.00488 ± 0.00486
BRIGHT	01/18/97	18	12	-99 ± -99	0.15976 ± 0.05267	0.10921 ± 0.00513	0.06347 ± 0.02019	0 ± 0.00007	0 ± 0.00054	-0.00552 ± 0.0055
BRIGHT	01/19/97	06	6	-99 ± -99	0.02915 ± 0.00961	0.03344 ± 0.00157	0.02927 ± 0.00931	0 ± 0.00006	0 ± 0.00043	0.01066 ± 0.01061
BRIGHT	01/19/97	12	6	-0.25961 ± 0.02055	-0.0044 ± 0.00145	-0.02069 ± 0.00097	0.13691 ± 0.04355	0 ± 0.00003	0 ± 0.00016	0.00557 ± 0.00554
BRIGHT	01/19/97	18	12	-0.07267 ± 0.00575	0.00351 ± 0.00116	0.23275 ± 0.01094	0.07288 ± 0.02318	0 ± 0.00022	0 ± 0.00166	-0.00866 ± 0.00862
BRIGHT	01/20/97	06	6	-99 ± -99	0.01158 ± 0.00382	0.1603 ± 0.00753	0.32047 ± 0.10195	0 ± 0.00005	0 ± 0.00022	0.01808 ± 0.01801
BRIGHT	01/20/97	12	6	-99 ± -99	0.02909 ± 0.00959	0.09049 ± 0.00425	0.09001 ± 0.02863	0 ± 0.00005	0 ± 0.00054	0.01967 ± 0.01958
BRIGHT	01/27/97	06	6	0.10473 ± 0.00829	0.0172 ± 0.00567	0.01862 ± 0.00087	0.04162 ± 0.01324	0 ± 0.00025	0 ± 0.00051	-0.00498 ± 0.00496
BRIGHT	01/27/97	12	6	0.7502 ± 0.05939	0.00028 ± 0.00009	0.01742 ± 0.00082	0.0155 ± 0.00493	0 ± 0.00016	0 ± 0.00018	0.00394 ± 0.00392
BRIGHT	01/27/97	18	12	-99 ± -99	0.0058 ± 0.00191	0.10411 ± 0.00489	0.11013 ± 0.03504	0 ± 0.00022	0 ± 0.00063	-0.00993 ± 0.00989
BRIGHT	01/28/97	12	6	-99 ± -99	0.01323 ± 0.00436	0.2527 ± 0.01188	0.2028 ± 0.06452	0 ± 0.00037	0 ± 0.0015	-0.00704 ± 0.00701
BRIGHT	01/28/97	18	12	0.25882 ± 0.02049	-0.02489 ± 0.00821	0.04388 ± 0.00206	0.01741 ± 0.00554	0 ± 0.00012	0 ± 0.0003	0.00078 ± 0.00077
BRIGHT	01/29/97	06	6	1.53978 ± 0.12189	-0.01052 ± 0.00347	-0.00614 ± 0.00029	0.08672 ± 0.02759	0 ± 0.0002	0 ± 0.00045	0.00943 ± 0.00938
BRIGHT	01/29/97	12	6	1.0855 ± 0.08593	0.02106 ± 0.00694	-0.02741 ± 0.00129	0.0217 ± 0.0069	0 ± 0.00021	0 ± 0.00027	-0.00204 ± 0.00203
BRIGHT	01/29/97	18	12	-99 ± -99	-0.00302 ± 0.001	-0.0092 ± 0.00043	0.02415 ± 0.00768	0 ± 0.00012	0 ± 0.00013	0.00424 ± 0.00422
BRIGHT	01/30/97	06	6	0.13026 ± 0.01031	0.00868 ± 0.00286	-0.0002 ± 0.00001	0.15983 ± 0.05084	0 ± 0.00004	0 ± 0.0002	0.02309 ± 0.023
BRIGHT	01/30/97	12	6	-99 ± -99	-0.0056 ± 0.00185	-0.0074 ± 0.00035	0.07322 ± 0.02329	0 ± 0.00002	0 ± 0.00007	0.01267 ± 0.01262
BRIGHT	01/30/97	18	12	-99 ± -99	-0.00682 ± 0.00225	-0.00184 ± 0.00009	0.03462 ± 0.01101	0 ± 0.00003	0 ± 0.00002	0.00592 ± 0.00589

Table C.1A-2 (continued)
Contributions to Total Carbon at Core Sites for Individual Samples - NFRAQS Winter 1996/97, Extended Species CMB

Site ID	Date	Start Hour	Duration (hrs)	Total Carbon (µg/m^3)	R-square	Chi-square	Percent of Mass	Incremental cold start ("puffers")	Hot stabilized, non-smoking	Smoking LDGV exhaust	Diesel Exhaust
WELBY	12/18/96	12	6	2.3752 ± 0.40484	0.90377	0.4508	107.705	-0.07396 ± 0.00642	0.36834 ± 0.02401	1.30069 ± 0.05284	0.6682 ± 0.02648
WELBY	12/19/96	06	6	9.1381 ± 0.70599	0.927	0.49731	112.131	0.50283 ± 0.04368	1.04006 ± 0.06779	4.07502 ± 0.16555	2.41899 ± 0.09588
WELBY	12/19/96	12	6	8.9716 ± 0.68245	0.93103	0.42077	94.2949	1.37419 ± 0.11937	0.78255 ± 0.051	3.61754 ± 0.14697	2.74683 ± 0.10887
WELBY	12/19/96	18	12	6.2265 ± 0.43308	0.87751	0.8296	98.3231	2.21337 ± 0.19226	0.91488 ± 0.05963	-0.64707 ± 0.02629	1.60827 ± 0.06375
WELBY	12/20/96	06	6	10.3091 ± 0.75354	0.89281	0.57922	107.337	5.04939 ± 0.43861	1.28726 ± 0.0839	-0.98814 ± 0.04014	2.26193 ± 0.08965
WELBY	12/25/96	06	6	3.0894 ± 0.43074	0.93949	0.28542	105.787	0.01668 ± 0.00145	0.15932 ± 0.01038	1.94528 ± 0.07903	0.96352 ± 0.03819
WELBY	12/25/96	12	6	1.9275 ± 0.42175	0.86983	0.39052	123.483	-0.09765 ± 0.00848	0.15477 ± 0.01009	1.75411 ± 0.07126	0.26114 ± 0.01035
WELBY	12/25/96	18	12	1.0611 ± 0.20434	0.96283	0.1544	91.588	-0.15461 ± 0.01343	0.01516 ± 0.00099	0.72737 ± 0.02955	0.38714 ± 0.01534
WELBY	12/30/96	06	6	4.8817 ± 0.48974	0.82721	0.7915	135.081	1.26892 ± 0.11022	0.87383 ± 0.05695	0.73248 ± 0.02976	1.34381 ± 0.05326
WELBY	12/30/96	12	6	7.8759 ± 0.62808	0.89613	0.48401	115.822	2.1202 ± 0.18417	0.42992 ± 0.02802	1.21024 ± 0.04917	3.0566 ± 0.12115
WELBY	12/30/96	18	12	8.1364 ± 0.53575	0.93275	0.40653	102.551	2.07019 ± 0.17983	0.23111 ± 0.01506	2.48218 ± 0.10084	2.39944 ± 0.0951
WELBY	12/31/96	06	6	8.8482 ± 0.67612	0.92342	0.38811	103.39	-0.34757 ± 0.03019	0.09372 ± 0.00611	3.38701 ± 0.1376	4.78034 ± 0.18947
WELBY	12/31/96	12	6	6.0156 ± 0.53433	0.86193	0.65173	122.643	2.19899 ± 0.19101	0.33404 ± 0.02177	1.6547 ± 0.06722	1.0949 ± 0.0434
WELBY	12/31/96	18	12	9.2681 ± 0.60544	0.84326	0.98928	102.979	3.20005 ± 0.27797	0.13055 ± 0.00851	-99 ± -99	1.86335 ± 0.07386
WELBY	01/01/97	06	6	3.8644 ± 0.45096	0.80837	0.87535	116.785	3.42041 ± 0.29711	0.83629 ± 0.0545	-99 ± -99	-0.65846 ± 0.0261
WELBY	01/01/97	12	6	6.6982 ± 0.57002	0.91336	0.48448	110.43	3.15827 ± 0.27434	0.89248 ± 0.05817	0.2465 ± 0.01001	0.76316 ± 0.03025
WELBY	01/01/97	18	12	7.4491 ± 0.49909	0.86078	1.07183	111.064	-99 ± -99	1.05583 ± 0.06881	0.28361 ± 0.01152	2.0098 ± 0.07966
WELBY	01/02/97	06	6	14.7302 ± 0.99845	0.94831	0.30692	109.491	5.3047 ± 0.46079	1.13765 ± 0.07415	-99 ± -99	5.42479 ± 0.21502
WELBY	01/02/97	12	6	6.9267 ± 0.57931	0.91639	0.45934	111.9	0.59992 ± 0.05211	0.55465 ± 0.03615	1.69718 ± 0.06895	2.23877 ± 0.08874
WELBY	01/02/97	18	12	6.7955 ± 0.45985	0.92603	0.43418	103.929	2.71647 ± 0.23597	0.73358 ± 0.04781	-99 ± -99	2.08879 ± 0.08279
WELBY	01/06/97	06	6	2.0504 ± 0.38486	0.9035	0.44255	97.7999	0.86016 ± 0.07472	0.10267 ± 0.00669	-99 ± -99	0.19813 ± 0.00785
WELBY	01/06/97	12	6	3.2002 ± 0.43092	0.93675	0.30957	83.4631	1.48445 ± 0.12895	0.15908 ± 0.01037	-1.11592 ± 0.04534	0.37303 ± 0.01479
WELBY	01/06/97	18	12	5.8841 ± 0.41748	0.91765	0.56058	98.0311	0.01015 ± 0.00088	0.05685 ± 0.00371	2.18249 ± 0.08867	2.12573 ± 0.08426
WELBY	01/07/97	06	6	10.6938 ± 0.7712	0.89877	0.59799	94.7872	4.26743 ± 0.37069	1.03682 ± 0.06757	1.55031 ± 0.06298	1.86401 ± 0.07388
WELBY	01/07/97	12	6	5.6521 ± 0.52687	0.90564	0.53508	98.332	0.42072 ± 0.03655	0.22845 ± 0.01489	2.22363 ± 0.09034	1.85218 ± 0.07341
WELBY	01/07/97	18	12	3.6093 ± 0.3	0.95372	0.26338	84.4171	1.77571 ± 0.15425	0.64441 ± 0.042	0.65143 ± 0.02646	0.06952 ± 0.00276
WELBY	01/08/97	06	6	9.4187 ± 0.70136	0.92051	0.48359	129.5	4.37889 ± 0.38037	0.78584 ± 0.05122	1.26188 ± 0.05126	2.56365 ± 0.10161
WELBY	01/12/97	06	6	1.8963 ± 0.50214	0.89251	0.43755	103.997	1.07415 ± 0.09331	0.62585 ± 0.04079	-99 ± -99	0.09911 ± 0.00393
WELBY	01/12/97	12	6	1.0145 ± 0.43233	0.90861	0.41414	89.8276	0.93405 ± 0.08114	0.2877 ± 0.01875	-0.03051 ± 0.00124	-0.07677 ± 0.00304
WELBY	01/12/97	18	12	3.9973 ± 0.31783	0.89666	0.68482	99.207	1.05726 ± 0.09184	0.13822 ± 0.00901	2.08078 ± 0.08453	0.62281 ± 0.02469
WELBY	01/13/97	06	6	3.3719 ± 0.42716	0.96316	0.19794	94.5547	0.34289 ± 0.02978	0.18986 ± 0.01237	3.69161 ± 0.14997	0.64229 ± 0.02546
WELBY	01/13/97	12	6	5.7312 ± 0.54123	0.97159	0.14584	88.7075	-0.46165 ± 0.0401	-0.0319 ± 0.00208	3.02817 ± 0.12302	1.79219 ± 0.07104
WELBY	01/13/97	18	12	5.8758 ± 0.42571	0.96819	0.19145	90.2272	0.7769 ± 0.06748	0.10552 ± 0.00688	3.50365 ± 0.14234	1.0106 ± 0.04006
WELBY	01/14/97	12	6	7.4994 ± 0.61221	0.97175	0.18661	96.2249	1.08291 ± 0.09407	0.24746 ± 0.01613	4.11609 ± 0.16722	1.85955 ± 0.07371
WELBY	01/14/97	18	12	6.5577 ± 0.45494	0.92315	0.47248	100.198	0.98231 ± 0.08533	0.13612 ± 0.00887	1.62989 ± 0.06622	0.93883 ± 0.03721

Table C.1A-2 (continued)
Contributions to Total Carbon at Core Sites for Individual Samples - NFRAQS Winter 1996/97, Extended Species CMB

Site ID	Date	Start Hour	Duration (hrs)	Meat Cooking	Wood Combustion (Softwood)	Wood Combustion (Hardwood)	Paved Road Dust	Ammonium Sulfate	Ammonium Nitrate	Coal-Fired Powerplant
WELBY	12/18/96	12	6	0.06312 ± 0.005	0.10419 ± 0.03435	0.01443 ± 0.00068	0.05435 ± 0.01729	0 ± 0.00008	0 ± 0.00017	0.0094 ± 0.00936
WELBY	12/19/96	06	6	-99 ± -99	0.49095 ± 0.16187	0.16084 ± 0.00756	0.28735 ± 0.09141	0 ± 0.0003	0 ± 0.00061	0.00615 ± 0.00613
WELBY	12/19/96	12	6	-99 ± -99	0.05112 ± 0.01686	0.02679 ± 0.00126	0.26204 ± 0.08336	0 ± 0.00045	0 ± 0.0014	-0.02468 ± 0.02457
WELBY	12/19/96	18	12	2.06533 ± 0.16349	0.03519 ± 0.0116	0.18038 ± 0.00848	0.15671 ± 0.04985	0 ± 0.00023	0 ± 0.00041	-0.01076 ± 0.01072
WELBY	12/20/96	06	6	0.4065 ± 0.03218	0.15661 ± 0.05164	1.45526 ± 0.0684	0.42676 ± 0.13576	0 ± 0.00017	0 ± 0.00034	-0.01238 ± 0.01233
WELBY	12/25/96	06	6	-0.10162 ± 0.00804	0.0566 ± 0.01866	-0.01336 ± 0.00063	0.08018 ± 0.02551	0 ± 0.00007	0 ± 0.0002	0.01284 ± 0.01279
WELBY	12/25/96	12	6	-99 ± -99	0.08184 ± 0.02698	-0.07521 ± 0.00353	0.10873 ± 0.03459	0 ± 0.00004	0 ± 0.00008	0.0048 ± 0.00478
WELBY	12/25/96	18	12	-99 ± -99	0.06878 ± 0.02268	-0.0228 ± 0.00107	0.06524 ± 0.02076	0 ± 0.00033	0 ± 0.00068	-0.00198 ± 0.00197
WELBY	12/30/96	06	6	0.00538 ± 0.00043	0.2562 ± 0.08447	0.29131 ± 0.01369	0.24647 ± 0.0784	0 ± 0.00003	0 ± 0.00013	0.01769 ± 0.01762
WELBY	12/30/96	12	6	-99 ± -99	0.0195 ± 0.00643	0.4553 ± 0.0214	0.51031 ± 0.16234	0 ± 0.00009	0 ± 0.00014	0.02249 ± 0.02239
WELBY	12/30/96	18	12	-99 ± -99	0.30694 ± 0.1012	0.22697 ± 0.01067	0.26877 ± 0.0855	0 ± 0.00011	0 ± 0.0002	-0.00293 ± 0.00292
WELBY	12/31/96	06	6	-99 ± -99	0.12319 ± 0.04062	0.15079 ± 0.00709	0.50174 ± 0.15961	0 ± 0.00019	0 ± 0.00059	0.04374 ± 0.04356
WELBY	12/31/96	12	6	-99 ± -99	0.05183 ± 0.01709	0.47628 ± 0.02239	0.35022 ± 0.11141	0 ± 0.00008	0 ± 0.00011	0.01492 ± 0.01485
WELBY	12/31/96	18	12	1.32934 ± 0.10523	0.57959 ± 0.19109	2.43593 ± 0.11449	0.25544 ± 0.08126	0 ± 0.0001	0 ± 0.00015	0.05674 ± 0.0565
WELBY	01/01/97	06	6	-99 ± -99	0.50246 ± 0.16566	0.81065 ± 0.0381	0.09596 ± 0.03052	0 ± 0.00005	0 ± 0.00016	0.02763 ± 0.02751
WELBY	01/01/97	12	6	1.00822 ± 0.07981	-0.05526 ± 0.01822	0.66648 ± 0.03132	0.30242 ± 0.09621	0 ± 0.00011	0 ± 0.00079	0.00845 ± 0.00842
WELBY	01/01/97	18	12	-99 ± -99	1.49833 ± 0.49401	2.71412 ± 0.12756	0.24189 ± 0.07695	0 ± 0.00009	0 ± 0.00021	0.00772 ± 0.00769
WELBY	01/02/97	06	6	1.18255 ± 0.09361	0.42827 ± 0.1412	0.91738 ± 0.04312	0.66948 ± 0.21297	0 ± 0.00028	0 ± 0.00041	0.04596 ± 0.04576
WELBY	01/02/97	12	6	0.99216 ± 0.07854	0.05836 ± 0.01924	0.15864 ± 0.00746	0.49533 ± 0.15757	0 ± 0.00011	0 ± 0.00014	0.02939 ± 0.02926
WELBY	01/02/97	18	12	1.39772 ± 0.11064	0.37745 ± 0.12445	0.11275 ± 0.0053	0.21473 ± 0.06831	0 ± 0.00009	0 ± 0.00017	0.01509 ± 0.01502
WELBY	01/06/97	06	6	0.59063 ± 0.04675	0.52546 ± 0.17325	-0.07665 ± 0.0036	0.04978 ± 0.01584	0 ± 0.00011	0 ± 0.00047	-0.00464 ± 0.00462
WELBY	01/06/97	12	6	1.92386 ± 0.15229	0.24301 ± 0.08012	-0.00422 ± 0.0002	0.25912 ± 0.08243	0 ± 0.00024	0 ± 0.00075	-0.02052 ± 0.02044
WELBY	01/06/97	18	12	1.27517 ± 0.10094	0.01412 ± 0.00466	-0.02422 ± 0.00114	0.32282 ± 0.10269	0 ± 0.00017	0 ± 0.00031	0.00179 ± 0.00179
WELBY	01/07/97	06	6	-99 ± -99	0.69253 ± 0.22833	0.55783 ± 0.02622	1.17623 ± 0.37418	0 ± 0.0002	0 ± 0.00046	0.00352 ± 0.0035
WELBY	01/07/97	12	6	-99 ± -99	0.019 ± 0.00626	0.06057 ± 0.00285	0.88323 ± 0.28097	0 ± 0.00015	0 ± 0.00084	-0.00475 ± 0.00473
WELBY	01/07/97	18	12	0.06664 ± 0.00527	0.03986 ± 0.01314	0.03386 ± 0.00159	0.33523 ± 0.10664	0 ± 0.00011	0 ± 0.00046	-0.00638 ± 0.00636
WELBY	01/08/97	06	6	-99 ± -99	0.04264 ± 0.01406	0.75032 ± 0.03526	0.32583 ± 0.10365	0 ± 0.00026	0 ± 0.00121	-0.00047 ± 0.00047
WELBY	01/12/97	06	6	-99 ± -99	0.14042 ± 0.0463	0.0942 ± 0.00443	0.0369 ± 0.01174	0 ± 0.00011	0 ± 0.00014	-0.00111 ± 0.0011
WELBY	01/12/97	12	6	-99 ± -99	0.16789 ± 0.05535	0.03015 ± 0.00142	0.04041 ± 0.01286	0 ± 0.00014	0 ± 0.0002	-0.01022 ± 0.01018
WELBY	01/12/97	18	12	-99 ± -99	0.06618 ± 0.02182	-0.00114 ± 0.00005	0.1035 ± 0.03292	0 ± 0.0002	0 ± 0.00054	-0.01401 ± 0.01395
WELBY	01/13/97	06	6	-1.46459 ± 0.11594	-0.01111 ± 0.00366	0.02145 ± 0.00101	0.06772 ± 0.02154	0 ± 0.00026	0 ± 0.00069	-0.00741 ± 0.00737
WELBY	01/13/97	12	6	1.0517 ± 0.08325	0.10287 ± 0.03392	0.02091 ± 0.00098	0.11872 ± 0.03777	0 ± 0.00061	0 ± 0.00142	-0.00633 ± 0.00631
WELBY	01/13/97	18	12	-99 ± -99	0.43733 ± 0.14419	0.00209 ± 0.0001	0.08912 ± 0.02835	0 ± 0.00041	0 ± 0.00139	-0.01955 ± 0.01946
WELBY	01/14/97	12	6	-99 ± -99	0.02877 ± 0.00949	0.04808 ± 0.00226	0.10725 ± 0.03412	0 ± 0.00086	0 ± 0.00111	-0.01544 ± 0.01537
WELBY	01/14/97	18	12	-99 ± -99	2.84955 ± 0.93951	0.25231 ± 0.01186	0.10972 ± 0.0349	0 ± 0.0008	0 ± 0.00077	-0.02084 ± 0.02075

Table C.1A-2 (continued)
Contributions to Total Carbon at Core Sites for Individual Samples - NFRAQS Winter 1996/97, Extended Species CMB

Site ID	Date	Start Hour	Duration (hrs)	Total Carbon (µg/m^3)	R-square	Chi-square	Percent of Mass	Incremental cold start ("puffers")	Hot stabilized, non-smoking	Smoking LDGV exhaust	Diesel Exhaust
WELBY	01/15/97	06	6	3.5217 ± 0.4306	0.94173	0.33316	99.2222	0.36445 ± 0.03166	0.3218 ± 0.02097	2.75143 ± 0.11178	1.03527 ± 0.04103
WELBY	01/15/97	12	6	3.8306 ± 0.45388	0.96084	0.18988	123.885	-0.43184 ± 0.03751	0.19676 ± 0.01282	2.74481 ± 0.11151	1.13503 ± 0.04499
WELBY	01/15/97	18	12	2.0713 ± 0.23502	0.94194	0.35036	112.472	1.22178 ± 0.10613	0.39498 ± 0.02574	0.45604 ± 0.01853	-0.21025 ± 0.00833
WELBY	01/16/97	06	6	3.7345 ± 0.44504	0.96029	0.21541	102.041	-0.19369 ± 0.01683	0.07503 ± 0.00489	3.35263 ± 0.1362	1.27063 ± 0.05036
WELBY	01/16/97	12	6	3.9759 ± 0.46497	0.95238	0.23834	100.645	-0.55855 ± 0.04852	0.06942 ± 0.00452	3.25472 ± 0.13223	0.92473 ± 0.03665
WELBY	01/16/97	18	12	9.886 ± 0.64307	0.9608	0.23393	95.0494	-0.50018 ± 0.04345	0.03487 ± 0.00227	6.01034 ± 0.24418	3.79536 ± 0.15043
WELBY	01/17/97	06	6	21.5508 ± 1.38265	0.95678	0.31214	92.9989	3.42322 ± 0.29736	0.68691 ± 0.04477	6.58657 ± 0.26759	6.84218 ± 0.2712
WELBY	01/17/97	12	6	5.6832 ± 0.51754	0.97467	0.13371	100.367	1.3666 ± 0.11871	0.46114 ± 0.03005	1.6024 ± 0.0651	1.44757 ± 0.05738
WELBY	01/17/97	18	12	9.3724 ± 0.61046	0.92174	0.41368	90.7253	-0.93296 ± 0.08104	-0.13699 ± 0.00893	6.15655 ± 0.25012	4.19433 ± 0.16625
WELBY	01/18/97	06	6	8.2556 ± 0.65308	0.88225	0.71666	101.6	2.54622 ± 0.22118	1.07951 ± 0.07036	1.45583 ± 0.05914	1.58505 ± 0.06283
WELBY	01/18/97	12	6	8.6759 ± 0.67215	0.92851	0.44392	106.712	1.94727 ± 0.16915	0.78297 ± 0.05103	1.21006 ± 0.04916	2.45847 ± 0.09744
WELBY	01/18/97	18	12	7.8984 ± 0.52917	0.9265	0.40892	87.0254	4.10827 ± 0.35686	0.58216 ± 0.03794	-0.7496 ± 0.03045	0.30225 ± 0.01198
WELBY	01/19/97	06	6	6.4933 ± 0.57606	0.93111	0.398	109.711	1.57607 ± 0.13691	0.29929 ± 0.01951	2.94213 ± 0.11953	0.69284 ± 0.02746
WELBY	01/19/97	12	6	5.2777 ± 0.53001	0.8556	0.75814	161.401	0.50731 ± 0.04407	0.66385 ± 0.04327	3.80552 ± 0.1546	0.37861 ± 0.01501
WELBY	01/19/97	18	12	9.9079 ± 0.64591	0.93462	0.31834	97.0529	4.49838 ± 0.39075	0.50846 ± 0.03314	0.01611 ± 0.00065	1.16894 ± 0.04633
WELBY	01/20/97	06	6	10.1179 ± 0.74233	0.86794	0.62028	96.7564	5.40039 ± 0.4691	0.67687 ± 0.04411	1.04843 ± 0.04259	2.20164 ± 0.08726
WELBY	01/20/97	12	6	6.5692 ± 0.55964	0.91992	0.45569	120.114	1.08059 ± 0.09387	0.46268 ± 0.03015	2.88938 ± 0.11738	1.64821 ± 0.06533
WELBY	01/20/97	18	12	5.2554 ± 0.37964	0.91287	0.44615	145.254	3.56397 ± 0.30958	0.40207 ± 0.0262	-0.05973 ± 0.00243	0.89108 ± 0.03532
WELBY	01/27/97	06	6	4.1984 ± 0.46026	0.92769	0.38307	81.1228	3.75814 ± 0.32645	0.4252 ± 0.02771	0.33824 ± 0.01374	-0.65572 ± 0.02599
WELBY	01/27/97	12	6	3.1034 ± 0.41811	0.9747	0.13531	91.3311	0.19889 ± 0.01728	0.01219 ± 0.00079	1.88777 ± 0.07669	0.85778 ± 0.034
WELBY	01/27/97	18	12	4.8443 ± 0.35712	0.94889	0.30045	98.213	1.22443 ± 0.10636	-0.09472 ± 0.00617	1.95069 ± 0.07925	1.36202 ± 0.05399
WELBY	01/28/97	06	6	6.455 ± 0.55234	0.91079	0.418	89.1911	0.07635 ± 0.00663	0.04259 ± 0.00278	2.62436 ± 0.10662	2.71967 ± 0.1078
WELBY	01/28/97	12	6	8.0417 ± 0.62534	0.95414	0.23169	78.7171	2.22986 ± 0.1937	0.21908 ± 0.01428	1.82662 ± 0.07421	2.41302 ± 0.09564
WELBY	01/28/97	18	12	5.0998 ± 0.37237	0.97067	0.1569	100.184	2.38474 ± 0.20715	0.11056 ± 0.00721	1.43714 ± 0.05839	0.61863 ± 0.02452
WELBY	01/29/97	06	6	5.4261 ± 0.50464	0.96425	0.21505	94.574	0.8438 ± 0.0733	0.15015 ± 0.00979	2.43097 ± 0.09876	1.86421 ± 0.07389
WELBY	01/29/97	12	6	2.6827 ± 0.40664	0.97446	0.12382	123.225	0.46456 ± 0.04035	-0.05723 ± 0.00373	1.61246 ± 0.06551	0.5005 ± 0.01984
WELBY	01/29/97	18	12	3.7229 ± 0.3058	0.93998	0.36747	87.8062	1.26195 ± 0.10962	0.07481 ± 0.00488	1.12574 ± 0.04573	0.86439 ± 0.03426
WELBY	01/30/97	06	6	10.8401 ± 0.7685	0.78205	0.98648	105.349	4.95686 ± 0.43058	0.71166 ± 0.04638	-0.37771 ± 0.01534	2.84172 ± 0.11263
WELBY	01/30/97	12	6	4.3359 ± 0.47137	0.90064	0.34547	182.476	-0.00656 ± 0.00057	0.38095 ± 0.02483	2.10926 ± 0.08569	0.96699 ± 0.03833
WELBY	01/30/97	18	12	1.9016 ± 0.22841	0.87477	0.46159	169.321	0.03352 ± 0.00291	0.22344 ± 0.01456	0.88091 ± 0.03579	0.19073 ± 0.00756

Table C.1A-2 (continued)
Contributions to Total Carbon at Core Sites for Individual Samples - NFRAQS Winter 1996/97, Extended Species CMB

Site ID	Date	Start Hour	Duration (hrs)	Meat Cooking	Wood Combustion (Softwood)	Wood Combustion (Hardwood)	Paved Road Dust	Ammonium Sulfate	Ammonium Nitrate	Coal-Fired Powerplant
WELBY	01/15/97	06	6	-0.97772 ± 0.0774	-0.00525 ± 0.00173	0.02196 ± 0.00103	0.09093 ± 0.02893	0 ± 0.0002	0 ± 0.00018	-0.00086 ± 0.00086
WELBY	01/15/97	12	6	-99 ± -99	0.01863 ± 0.00614	-0.00102 ± 0.00005	0.05693 ± 0.01811	0 ± 0.00018	0 ± 0.00021	0.00337 ± 0.00336
WELBY	01/15/97	18	12	0.07104 ± 0.00562	0.08052 ± 0.02655	0.07027 ± 0.0033	0.05471 ± 0.0174	0 ± 0.00025	0 ± 0.00019	-0.00147 ± 0.00146
WELBY	01/16/97	06	6	-0.93581 ± 0.07408	-0.00457 ± 0.00151	0.01268 ± 0.0006	0.16083 ± 0.05116	0 ± 0.0003	0 ± 0.00033	0.00242 ± 0.00241
WELBY	01/16/97	12	6	-0.15098 ± 0.01195	0.0399 ± 0.01315	-0.01404 ± 0.00066	0.41623 ± 0.13241	0 ± 0.00025	0 ± 0.00034	0.0107 ± 0.01066
WELBY	01/16/97	18	12	-0.2033 ± 0.01609	-0.02752 ± 0.00907	-0.02004 ± 0.00094	0.52732 ± 0.16775	0 ± 0.00047	0 ± 0.00102	-0.00622 ± 0.0062
WELBY	01/17/97	06	6	2.11067 ± 0.16708	0.08164 ± 0.02692	1.04845 ± 0.04928	0.57681 ± 0.18349	0 ± 0.00096	0 ± 0.00193	-0.00111 ± 0.0011
WELBY	01/17/97	12	6	0.62339 ± 0.04935	0.02838 ± 0.00936	-0.03944 ± 0.00185	0.22834 ± 0.07264	0 ± 0.00038	0 ± 0.00156	-0.01256 ± 0.01251
WELBY	01/17/97	18	12	-0.54893 ± 0.04345	-0.01791 ± 0.0059	-0.02699 ± 0.00127	0.38413 ± 0.1222	0 ± 0.00032	0 ± 0.00114	-0.01545 ± 0.01538
WELBY	01/18/97	06	6	0.94892 ± 0.07512	0.2487 ± 0.082	0.06098 ± 0.00287	0.47776 ± 0.15198	0 ± 0.00009	0 ± 0.00051	-0.00246 ± 0.00245
WELBY	01/18/97	12	6	1.47286 ± 0.11659	-0.04718 ± 0.01555	0.64944 ± 0.03052	0.36584 ± 0.11638	0 ± 0.00011	0 ± 0.0009	-0.01058 ± 0.01053
WELBY	01/18/97	18	12	1.77446 ± 0.14047	0.82583 ± 0.27228	1.11486 ± 0.0524	0.09217 ± 0.02932	0 ± 0.00008	0 ± 0.00049	0.0085 ± 0.00847
WELBY	01/19/97	06	6	0.48679 ± 0.03853	0.14904 ± 0.04914	-0.00447 ± 0.00021	0.18756 ± 0.05967	0 ± 0.00008	0 ± 0.0003	0.01571 ± 0.01564
WELBY	01/19/97	12	6	-99 ± -99	-0.00601 ± 0.00198	0.05748 ± 0.0027	0.09293 ± 0.02956	0 ± 0.00006	0 ± 0.00016	0.01683 ± 0.01676
WELBY	01/19/97	18	12	2.56289 ± 0.20288	0.17453 ± 0.05754	0.90309 ± 0.04245	0.21138 ± 0.06724	0 ± 0.00005	0 ± 0.00021	0.00365 ± 0.00363
WELBY	01/20/97	06	6	0.08036 ± 0.00636	0.07527 ± 0.02482	0.45283 ± 0.02128	0.35222 ± 0.11205	0 ± 0.00007	0 ± 0.00031	0.04672 ± 0.04652
WELBY	01/20/97	12	6	-99 ± -99	0.0122 ± 0.00402	0.01998 ± 0.00094	0.23547 ± 0.07491	0 ± 0.00007	0 ± 0.00024	0.02508 ± 0.02498
WELBY	01/20/97	18	12	-99 ± -99	-0.01674 ± 0.00552	0.64645 ± 0.03038	0.0832 ± 0.02647	0 ± 0.00011	0 ± 0.0004	-0.00681 ± 0.00678
WELBY	01/27/97	06	6	-99 ± -99	0.35645 ± 0.11752	0.09124 ± 0.00429	0.18756 ± 0.05967	0 ± 0.00036	0 ± 0.0007	-0.01126 ± 0.01122
WELBY	01/27/97	12	6	-99 ± -99	-0.0364 ± 0.012	0.01519 ± 0.00071	0.05626 ± 0.0179	0 ± 0.00028	0 ± 0.00048	-0.00179 ± 0.00178
WELBY	01/27/97	18	12	-99 ± -99	0.14306 ± 0.04717	0.04913 ± 0.00231	0.11505 ± 0.0366	0 ± 0.0003	0 ± 0.00068	-0.01626 ± 0.0162
WELBY	01/28/97	06	6	-99 ± -99	-0.07988 ± 0.02634	0.00203 ± 0.0001	0.91245 ± 0.29026	0 ± 0.00009	0 ± 0.0003	0.0467 ± 0.0465
WELBY	01/28/97	12	6	-99 ± -99	-0.07775 ± 0.02564	0.01451 ± 0.00068	1.33853 ± 0.42581	0 ± 0.00017	0 ± 0.00086	0.02699 ± 0.02688
WELBY	01/28/97	18	12	-99 ± -99	-0.00478 ± 0.00158	0.02477 ± 0.00116	0.49217 ± 0.15657	0 ± 0.00017	0 ± 0.00045	0.00306 ± 0.00305
WELBY	01/29/97	06	6	-99 ± -99	-0.04832 ± 0.01593	0.02601 ± 0.00122	0.09006 ± 0.02865	0 ± 0.00028	0 ± 0.00089	0.00537 ± 0.00535
WELBY	01/29/97	12	6	-99 ± -99	-0.02768 ± 0.00913	-0.00091 ± 0.00004	0.09975 ± 0.03173	0 ± 0.00025	0 ± 0.00038	0.00429 ± 0.00427
WELBY	01/29/97	18	12	0.08754 ± 0.00693	0.03512 ± 0.01158	0.00486 ± 0.00023	0.08787 ± 0.02795	0 ± 0.00015	0 ± 0.00019	0.00749 ± 0.00746
WELBY	01/30/97	06	6	0.77841 ± 0.06162	0.06367 ± 0.02099	1.07127 ± 0.05035	0.84811 ± 0.2698	0 ± 0.0001	0 ± 0.00022	0.03581 ± 0.03566
WELBY	01/30/97	12	6	0.61893 ± 0.04899	-0.00223 ± 0.00073	0.06053 ± 0.00284	0.16837 ± 0.05356	0 ± 0.00002	0 ± 0.00004	0.0218 ± 0.0217
WELBY	01/30/97	18	12	0.49553 ± 0.03923	-0.0191 ± 0.0063	0.02622 ± 0.00123	0.04769 ± 0.01517	0 ± 0.00002	0 ± 0.00001	0.00186 ± 0.00185

Table C.1A-3
Contributions to Organic Carbon at Core Sites for Individual Samples - NFRAQS Winter 1996/97, Extended Species CMB

Site ID	Date	Start Hour	Duration (hrs)	Organic Carbon (µg/m^3)	R-square	Chi-square	Percent of Mass	Incremental cold start ("puffers")	Hot stabilized, non-smoking	Smoking LDGV exhaust	Diesel Exhaust
BRIGHT	12/18/96	06	6	2.7069 ± 0.3937	0.94696	0.24884	107.156	-0.13566 ± 0.04212	0.0368 ± 0.00711	3.07055 ± 0.13383	0.26754 ± 0.11146
BRIGHT	12/18/96	12	6	1.033 ± 0.3641	0.86814	0.4292	67.2689	-0.04223 ± 0.01311	0.04214 ± 0.00815	1.52002 ± 0.06625	0.05445 ± 0.02268
BRIGHT	12/18/96	18	12	2.4536 ± 0.2706	0.91877	0.55765	174.449	0.07273 ± 0.02258	0.06798 ± 0.01314	2.01352 ± 0.08776	0.32883 ± 0.13699
BRIGHT	12/19/96	06	6	4.8511 ± 0.5403	0.90093	0.71493	97.5913	0.43092 ± 0.13378	0.21255 ± 0.04109	3.83811 ± 0.16729	0.25621 ± 0.10674
BRIGHT	12/19/96	12	6	6.005 ± 0.6123	0.95264	0.28973	87.797	0.71851 ± 0.22306	0.34533 ± 0.06675	3.84138 ± 0.16743	0.49342 ± 0.20557
BRIGHT	12/19/96	18	12	1.641 ± 0.2207	0.95264	0.27804	97.5091	0.17526 ± 0.05441	0.15305 ± 0.02958	1.06282 ± 0.04632	0.15931 ± 0.06637
BRIGHT	12/20/96	06	6	1.8913 ± 0.374	0.94627	0.1404	98.4816	-0.19024 ± 0.05906	0.01644 ± 0.00318	1.66391 ± 0.07252	0.24415 ± 0.10172
BRIGHT	12/25/96	06	6	1.2588 ± 0.3545	0.82737	0.3782	122.389	0.00842 ± 0.00261	0.0872 ± 0.01685	1.34086 ± 0.05844	0.05691 ± 0.02371
BRIGHT	12/25/96	12	6	0.7011 ± 0.4012	0.86192	0.49436	116.647	-0.03078 ± 0.00956	0.04656 ± 0.009	1.08261 ± 0.04719	0.01951 ± 0.00813
BRIGHT	12/25/96	18	12	0.3203 ± 0.1965	0.90966	0.38346	111.531	0.02453 ± 0.00762	0.00239 ± 0.00046	0.24566 ± 0.01071	0.04399 ± 0.01833
BRIGHT	12/26/96	06	6	1.456 ± 0.3607	0.95011	0.23806	85.5113	0.04615 ± 0.01433	0.00651 ± 0.00126	1.35117 ± 0.05889	0.09726 ± 0.04052
BRIGHT	12/26/96	12	6	1.1828 ± 0.3488	0.91168	0.4276	114.996	0.08886 ± 0.02759	0.04806 ± 0.00929	0.07363 ± 0.00321	0.07264 ± 0.03026
BRIGHT	12/26/96	18	12	0.8585 ± 0.186	0.94882	0.26857	120.921	0.10479 ± 0.03253	0.05838 ± 0.01128	0.49856 ± 0.02173	0.0806 ± 0.03358
BRIGHT	12/30/96	06	6	2.0109 ± 0.3818	0.90027	0.34308	107.852	0.03982 ± 0.01236	0.2025 ± 0.03914	0.51948 ± 0.02264	0.20374 ± 0.08488
BRIGHT	12/30/96	12	6	0.9652 ± 0.4237	0.8281	0.45871	97.5083	-0.08267 ± 0.02566	0.21483 ± 0.04153	0.565 ± 0.02463	0.22478 ± 0.09365
BRIGHT	12/30/96	18	12	1.2004 ± 0.1998	0.91522	0.48103	109.215	0.16012 ± 0.04971	0.07719 ± 0.01492	0.50748 ± 0.02212	0.16212 ± 0.06754
BRIGHT	12/31/96	06	6	3.05 ± 0.435	0.95116	0.21564	108.314	-0.21939 ± 0.06811	0.00939 ± 0.00182	2.9086 ± 0.12677	0.46144 ± 0.19224
BRIGHT	12/31/96	12	6	1.8734 ± 0.3714	0.92289	0.39994	134.718	0.04278 ± 0.01328	0.06474 ± 0.01251	1.33834 ± 0.05833	0.31115 ± 0.12963
BRIGHT	12/31/96	18	12	1.8685 ± 0.2329	0.88751	0.5466	117.748	0.23933 ± 0.0743	0.06934 ± 0.0134	1.18281 ± 0.05155	0.17038 ± 0.07098
BRIGHT	01/01/97	06	6	1.2174 ± 0.3523	0.89792	0.39318	113.824	0.3393 ± 0.10533	0.09495 ± 0.01835	0.70596 ± 0.03077	-0.01495 ± 0.00623
BRIGHT	01/01/97	12	6	3.3802 ± 0.4462	0.87896	0.65062	134.745	0.24327 ± 0.07552	0.04279 ± 0.00827	2.52267 ± 0.10995	0.28092 ± 0.11703
BRIGHT	01/01/97	18	12	1.6681 ± 0.2227	0.92624	0.41979	127.122	0.0822 ± 0.02552	0.07306 ± 0.01412	1.45952 ± 0.06361	0.16099 ± 0.06707
BRIGHT	01/02/97	06	6	2.659 ± 0.4136	0.90415	0.30344	110.666	0.1547 ± 0.04802	0.1464 ± 0.0283	2.02505 ± 0.08826	0.2732 ± 0.11382
BRIGHT	01/02/97	12	6	2.5907 ± 0.4063	0.88166	0.41006	142.416	-0.05724 ± 0.01777	0.19204 ± 0.03712	1.93933 ± 0.08453	0.20083 ± 0.08367
BRIGHT	01/02/97	18	12	1.6876 ± 0.2233	0.94117	0.30128	156.115	0.26022 ± 0.08078	0.07246 ± 0.01401	1.23885 ± 0.054	0.20326 ± 0.08468
BRIGHT	01/06/97	06	6	0.8169 ± 0.4076	0.91285	0.28958	109.72	-99 ± -99	0.25674 ± 0.04963	0.19708 ± 0.00859	0.02681 ± 0.01117
BRIGHT	01/06/97	12	6	1.2314 ± 0.3482	0.97759	0.08534	110.339	-0.1545 ± 0.04796	0.01523 ± 0.00294	1.3693 ± 0.05968	0.18879 ± 0.07865
BRIGHT	01/06/97	18	12	1.6725 ± 0.2206	0.947	0.30669	96.1483	-0.0264 ± 0.0082	0.02971 ± 0.00574	1.54848 ± 0.06749	0.25576 ± 0.10655
BRIGHT	01/07/97	06	6	3.3408 ± 0.446	0.9656	0.15628	103.44	-0.26946 ± 0.08365	-0.04217 ± 0.00815	2.79495 ± 0.12182	0.5105 ± 0.21268
BRIGHT	01/07/97	12	6	2.5613 ± 0.408	0.9621	0.19814	102.617	-0.00258 ± 0.0008	0.05203 ± 0.01006	2.3149 ± 0.1009	0.42506 ± 0.17708
BRIGHT	01/07/97	18	12	0.8722 ± 0.1835	0.95963	0.20596	107.482	0.02685 ± 0.00833	0.09203 ± 0.01779	0.54405 ± 0.02371	0.04954 ± 0.02064
BRIGHT	01/08/97	06	6	3.0425 ± 0.4331	0.97186	0.13964	93.4303	0.44123 ± 0.13698	0.01729 ± 0.00334	2.25044 ± 0.09809	0.30638 ± 0.12764
BRIGHT	01/12/97	06	6	0.108 ± 0.3501	0.8585	0.32911	59.4525	-0.0731 ± 0.02269	0.02927 ± 0.00566	0.52623 ± 0.02294	0.03205 ± 0.01335
BRIGHT	01/12/97	12	6	0.6139 ± 0.3885	0.9147	0.2786	83.8301	-0.08158 ± 0.02533	0.02662 ± 0.00515	0.80947 ± 0.03528	0.04411 ± 0.01838
BRIGHT	01/12/97	18	12	2.6464 ± 0.2804	0.88073	0.6962	91.9326	-0.01494 ± 0.00464	0.00559 ± 0.00108	2.11149 ± 0.09203	0.18087 ± 0.07535

Table C.1A-3 (continued)
Contributions to Organic Carbon at Core Sites for Individual Samples - NFRAQS Winter 1996/97, Extended Species CMB

Site ID	Date	Start Hour	Duration (hrs)	Meat Cooking	Wood Combustion (Softwood)	Wood Combustion (Hardwood)	Paved Road Dust	Ammonium Sulfate	Ammonium Nitrate	Coal-Fired Powerplant
BRIGHT	12/18/96	06	6	-0.51559 ± 0.04116	0.01452 ± 0.00509	-0.01435 ± 0.00101	0.07611 ± 0.03048	0 ± 0.00011	0 ± 0.00017	0 ± 0.00075
BRIGHT	12/18/96	12	6	-0.30302 ± 0.02419	0.00879 ± 0.00308	-0.04314 ± 0.00303	0.13264 ± 0.05312	0 ± 0.00006	0 ± 0.00006	0 ± 0.01458
BRIGHT	12/18/96	18	12	-99 ± -99	0.04808 ± 0.01684	0.03669 ± 0.00258	0.04528 ± 0.01814	0 ± 0.00013	0 ± 0.00015	0 ± 0.00365
BRIGHT	12/19/96	06	6	-0.26814 ± 0.02141	0.30552 ± 0.10699	0.0723 ± 0.00508	0.10971 ± 0.04394	0 ± 0.00022	0 ± 0.00039	0 ± 0.00481
BRIGHT	12/19/96	12	6	-99 ± -99	0.06996 ± 0.0245	0.41559 ± 0.02921	0.19101 ± 0.0765	0 ± 0.00035	0 ± 0.0011	0 ± 0.01213
BRIGHT	12/19/96	18	12	-99 ± -99	0.03492 ± 0.01223	0.01566 ± 0.0011	0.0411 ± 0.01646	0 ± 0.00007	0 ± 0.00016	0 ± 0.00454
BRIGHT	12/20/96	06	6	-99 ± -99	0.00699 ± 0.00245	-0.01137 ± 0.0008	0.05743 ± 0.023	0 ± 0.00003	0 ± 0.0001	0 ± 0.00283
BRIGHT	12/25/96	06	6	-0.13508 ± 0.01078	0.04565 ± 0.01599	-0.00262 ± 0.00018	0.06014 ± 0.02408	0 ± 0.00001	0 ± 0.00003	0 ± 0.00275
BRIGHT	12/25/96	12	6	-0.20796 ± 0.0166	0.0101 ± 0.00354	-0.01003 ± 0.0007	0.06724 ± 0.02693	0 ± 0.00004	0 ± 0.00012	0 ± 0.00527
BRIGHT	12/25/96	18	12	-99 ± -99	0.00701 ± 0.00246	0.04122 ± 0.0029	0.03752 ± 0.01503	0 ± 0.00027	0 ± 0.00064	0 ± 0.00171
BRIGHT	12/26/96	06	6	-99 ± -99	0.02265 ± 0.00793	-0.03017 ± 0.00212	0.13037 ± 0.05222	0 ± 0.00032	0 ± 0.00066	0 ± 0.00384
BRIGHT	12/26/96	12	6	0.60587 ± 0.04837	0.02179 ± 0.00763	0.12364 ± 0.00869	0.16899 ± 0.06768	0 ± 0.00028	0 ± 0.00063	0 ± 0.00451
BRIGHT	12/26/96	18	12	-99 ± -99	0.01188 ± 0.00416	0.0129 ± 0.00091	0.09635 ± 0.03859	0 ± 0.00016	0 ± 0.00036	0 ± 0.00435
BRIGHT	12/30/96	06	6	0.65112 ± 0.05199	0.00241 ± 0.00085	0.28282 ± 0.01988	0.11101 ± 0.04446	0 ± 0.00004	0 ± 0.00004	0 ± 0.00932
BRIGHT	12/30/96	12	6	-0.27635 ± 0.02206	-0.03279 ± 0.01148	0.22105 ± 0.01554	0.15339 ± 0.06143	0 ± 0.00005	0 ± 0.00002	0 ± 0.00477
BRIGHT	12/30/96	18	12	-0.11367 ± 0.00908	0.07415 ± 0.02597	0.26405 ± 0.01856	0.08786 ± 0.03519	0 ± 0.00006	0 ± 0.00005	0 ± 0.00267
BRIGHT	12/31/96	06	6	-0.37691 ± 0.03009	0.00792 ± 0.00277	-0.01113 ± 0.00078	0.21497 ± 0.0861	0 ± 0.00008	0 ± 0.00025	0 ± 0.00429
BRIGHT	12/31/96	12	6	-99 ± -99	-0.00132 ± 0.00046	-0.00618 ± 0.00043	0.17638 ± 0.07064	0 ± 0.00008	0 ± 0.0003	0 ± 0.01265
BRIGHT	12/31/96	18	12	-99 ± -99	0.03639 ± 0.01274	0.00864 ± 0.00061	0.12355 ± 0.04948	0 ± 0.00003	0 ± 0.00003	0 ± 0.00421
BRIGHT	01/01/97	06	6	-99 ± -99	-99 ± -99	0.0957 ± 0.00673	0.11031 ± 0.04418	0 ± 0.00004	0 ± 0.00014	0 ± 0.00227
BRIGHT	01/01/97	12	6	-99 ± -99	-0.02881 ± 0.01009	0.02313 ± 0.00163	0.33473 ± 0.13406	0 ± 0.00013	0 ± 0.00068	0 ± 0.00669
BRIGHT	01/01/97	18	12	-0.24452 ± 0.01952	-0.01066 ± 0.00373	0.00334 ± 0.00023	0.1493 ± 0.05979	0 ± 0.00005	0 ± 0.00009	0 ± 0.00201
BRIGHT	01/02/97	06	6	-0.1963 ± 0.01567	-0.0134 ± 0.00469	0.09215 ± 0.00648	0.24547 ± 0.09831	0 ± 0.00003	0 ± 0.00002	0 ± 0.00966
BRIGHT	01/02/97	12	6	-99 ± -99	-0.01753 ± 0.00614	-0.00122 ± 0.00009	0.29002 ± 0.11616	0 ± 0.00004	0 ± 0.00005	0 ± 0.00133
BRIGHT	01/02/97	18	12	-0.27273 ± 0.02177	0.0037 ± 0.0013	0.0013 ± 0.00009	0.16606 ± 0.06651	0 ± 0.00005	0 ± 0.00011	0 ± 0.00129
BRIGHT	01/06/97	06	6	-99 ± -99	0.21449 ± 0.07511	0.13229 ± 0.0093	0.02449 ± 0.00981	0 ± 0.00003	0 ± 0.00022	0 ± 0.00115
BRIGHT	01/06/97	12	6	-0.23962 ± 0.01913	0.00188 ± 0.00066	-0.00391 ± 0.00027	0.02455 ± 0.00983	0 ± 0.00007	0 ± 0.00036	0 ± 0.00003
BRIGHT	01/06/97	18	12	-0.25763 ± 0.02057	-0.00143 ± 0.0005	0.0476 ± 0.00335	0.04442 ± 0.01779	0 ± 0.00011	0 ± 0.00027	0 ± 0.00138
BRIGHT	01/07/97	06	6	-99 ± -99	0.00971 ± 0.0034	-0.01515 ± 0.00107	0.14432 ± 0.0578	0 ± 0.0001	0 ± 0.0004	0 ± 0.00073
BRIGHT	01/07/97	12	6	-0.48946 ± 0.03908	-0.02994 ± 0.01049	0.02528 ± 0.00178	0.28464 ± 0.114	0 ± 0.00012	0 ± 0.00073	0 ± 0.00762
BRIGHT	01/07/97	18	12	-99 ± -99	-0.00301 ± 0.00105	0.04138 ± 0.00291	0.11945 ± 0.04784	0 ± 0.00008	0 ± 0.0002	0 ± 0.00005
BRIGHT	01/08/97	06	6	-99 ± -99	0.00828 ± 0.0029	-0.00749 ± 0.00053	0.06965 ± 0.0279	0 ± 0.0002	0 ± 0.00079	0 ± 0.00372
BRIGHT	01/12/97	06	6	-0.20599 ± 0.01645	0.01715 ± 0.00601	0.02292 ± 0.00161	0.02346 ± 0.0094	0 ± 0.00008	0 ± 0.00003	0 ± 0.0012
BRIGHT	01/12/97	12	6	-99 ± -99	0.02855 ± 0.01	-0.00224 ± 0.00016	0.04617 ± 0.01849	0 ± 0.00009	0 ± 0.00009	0 ± 0.00219
BRIGHT	01/12/97	18	12	-99 ± -99	-0.0051 ± 0.00178	0.10499 ± 0.00738	0.19328 ± 0.07741	0 ± 0.00016	0 ± 0.00041	0 ± 0.00425

Table C.1A-3 (continued)
Contributions to Organic Carbon at Core Sites for Individual Samples - NFRAQS Winter 1996/97, Extended Species CMB

Site ID	Date	Start Hour	Duration (hrs)	Organic Carbon (µg/m^3)	R-square	Chi-square	Percent of Mass	Incremental cold start ("puffers")	Hot stabilized, non-smoking	Smoking LDGV exhaust	Diesel Exhaust
BRIGHT	01/13/97	06	6	3.3154 ± 0.4382	0.96715	0.16167	104.478	-0.14866 ± 0.04615	-0.00083 ± 0.00016	3.06349 ± 0.13352	0.23789 ± 0.09911
BRIGHT	01/13/97	12	6	3.6964 ± 0.4691	0.96866	0.1359	83.0781	-0.2835 ± 0.08801	-0.02775 ± 0.00536	3.50456 ± 0.15275	0.24081 ± 0.10032
BRIGHT	01/13/97	18	12	4.062 ± 0.3811	0.95778	0.25771	90.2663	0.02018 ± 0.00626	0.04625 ± 0.00894	3.32148 ± 0.14477	0.34566 ± 0.14401
BRIGHT	01/14/97	06	6	6.0587 ± 0.6144	0.95196	0.28788	91.2966	0.41585 ± 0.1291	-0.02946 ± 0.0057	4.88166 ± 0.21277	0.34944 ± 0.14558
BRIGHT	01/14/97	12	6	2.7484 ± 0.4139	0.96109	0.19749	69.8811	-0.13524 ± 0.04199	0.13379 ± 0.02586	2.64607 ± 0.11533	0.1444 ± 0.06016
BRIGHT	01/14/97	18	12	3.4802 ± 0.3382	0.95692	0.28384	97.1516	0.21579 ± 0.06699	0.09379 ± 0.01813	3.02037 ± 0.13164	0.2706 ± 0.11273
BRIGHT	01/15/97	06	6	1.9134 ± 0.3719	0.95308	0.22366	62.4223	-0.18286 ± 0.05677	0.10913 ± 0.02109	1.99182 ± 0.08681	0.14545 ± 0.0606
BRIGHT	01/15/97	12	6	1.215 ± 0.3462	0.94333	0.28034	116.239	0.01266 ± 0.00393	0.06928 ± 0.01339	0.84485 ± 0.03682	0.07678 ± 0.03199
BRIGHT	01/15/97	18	12	0.9878 ± 0.1859	0.96899	0.13518	98.3563	-0.1573 ± 0.04883	0.05111 ± 0.00988	1.02926 ± 0.04486	0.05191 ± 0.02163
BRIGHT	01/16/97	06	6	1.7346 ± 0.3688	0.95821	0.20078	91.6799	-0.13819 ± 0.0429	0.05856 ± 0.01132	1.59265 ± 0.06942	0.21023 ± 0.08759
BRIGHT	01/16/97	12	6	2.1793 ± 0.3925	0.96945	0.13287	92.5676	-0.22231 ± 0.06902	-0.00299 ± 0.00058	2.18106 ± 0.09506	0.13801 ± 0.0575
BRIGHT	01/16/97	18	12	3.2603 ± 0.3154	0.91445	0.58308	89.7666	0.05952 ± 0.01848	-0.01722 ± 0.00333	2.50945 ± 0.10938	0.32583 ± 0.13575
BRIGHT	01/17/97	06	6	6.4101 ± 0.6465	0.93106	0.44455	95.7647	0.37857 ± 0.11753	0.09049 ± 0.01749	4.82723 ± 0.2104	0.64868 ± 0.27025
BRIGHT	01/17/97	12	6	4.3881 ± 0.5036	0.95877	0.23938	97.3321	0.62191 ± 0.19307	0.10762 ± 0.0208	1.36532 ± 0.05951	0.39083 ± 0.16282
BRIGHT	01/17/97	18	12	3.8572 ± 0.3644	0.93145	0.40475	88.3774	0.40709 ± 0.12638	0.01375 ± 0.00266	2.51875 ± 0.10978	0.51279 ± 0.21363
BRIGHT	01/18/97	06	6	3.2105 ± 0.445	0.92153	0.37625	141.516	0.38032 ± 0.11807	0.14477 ± 0.02798	2.1386 ± 0.09321	0.27765 ± 0.11567
BRIGHT	01/18/97	12	6	2.0102 ± 0.3809	0.94237	0.24048	113.987	0.5289 ± 0.16419	0.01827 ± 0.00353	1.21206 ± 0.05283	0.17268 ± 0.07194
BRIGHT	01/18/97	18	12	2.325 ± 0.2678	0.92797	0.40816	101.699	0.16052 ± 0.04983	0.00797 ± 0.00154	1.69951 ± 0.07407	0.19779 ± 0.0824
BRIGHT	01/19/97	06	6	2.1573 ± 0.3902	0.93331	0.25646	157.052	-0.17563 ± 0.05452	0.05436 ± 0.01051	1.9984 ± 0.0871	0.19297 ± 0.08039
BRIGHT	01/19/97	12	6	2.6701 ± 0.4195	0.86155	0.43767	104.965	-0.08256 ± 0.02563	0.00615 ± 0.00119	2.81584 ± 0.12273	0.1238 ± 0.05158
BRIGHT	01/19/97	18	12	3.4687 ± 0.3401	0.96338	0.21055	90.0162	0.57434 ± 0.1783	0.0847 ± 0.01637	2.3633 ± 0.10301	0.24257 ± 0.10106
BRIGHT	01/20/97	06	6	4.133 ± 0.4923	0.904	0.4892	93.451	0.04114 ± 0.01277	0.22794 ± 0.04406	2.93256 ± 0.12782	0.42935 ± 0.17887
BRIGHT	01/20/97	12	6	2.8135 ± 0.4319	0.90779	0.43139	128.735	-0.08145 ± 0.02528	0.09032 ± 0.01746	2.0669 ± 0.09009	0.53037 ± 0.22096
BRIGHT	01/27/97	06	6	1.1467 ± 0.348	0.96685	0.13429	89.2059	-0.05503 ± 0.01708	-0.0255 ± 0.00493	0.90035 ± 0.03924	0.07988 ± 0.03328
BRIGHT	01/27/97	12	6	0.586 ± 0.3858	0.92615	0.27244	94.4204	0.14128 ± 0.04386	-0.01239 ± 0.00239	-0.09039 ± 0.00394	0.03759 ± 0.01566
BRIGHT	01/27/97	18	12	2.308 ± 0.2615	0.93919	0.35318	99.0156	0.37886 ± 0.11761	-0.00255 ± 0.00049	1.53416 ± 0.06687	0.20936 ± 0.08722
BRIGHT	01/28/97	12	6	3.4835 ± 0.4521	0.94523	0.28944	76.6791	0.79082 ± 0.24551	-0.05978 ± 0.01156	2.068 ± 0.09013	0.31278 ± 0.13031
BRIGHT	01/28/97	18	12	0.8329 ± 0.1828	0.91035	0.48349	86.72	0.06816 ± 0.02116	0.07625 ± 0.01474	0.40663 ± 0.01772	0.04765 ± 0.01985
BRIGHT	01/29/97	06	6	2.5266 ± 0.4075	0.95747	0.19574	102.231	0.88204 ± 0.27383	-0.07622 ± 0.01473	0.35205 ± 0.01534	-0.07923 ± 0.03301
BRIGHT	01/29/97	12	6	1.5543 ± 0.3625	0.92903	0.33933	114.113	0.32669 ± 0.10142	0.07289 ± 0.01409	0.17568 ± 0.00766	0.0368 ± 0.01533
BRIGHT	01/29/97	18	12	1.2941 ± 0.2037	0.95258	0.23933	104.998	-0.02186 ± 0.00679	0.00496 ± 0.00096	1.11666 ± 0.04867	0.16551 ± 0.06895
BRIGHT	01/30/97	06	6	3.7597 ± 0.4718	0.90171	0.48854	124.391	0.18361 ± 0.057	0.05597 ± 0.01082	3.02799 ± 0.13198	0.2985 ± 0.12436
BRIGHT	01/30/97	12	6	1.6272 ± 0.4017	0.87866	0.24076	125.023	-0.08901 ± 0.02763	0.07234 ± 0.01398	1.4748 ± 0.06428	0.07205 ± 0.03002
BRIGHT	01/30/97	18	12	1.0681 ± 0.1932	0.89778	0.33437	155.019	-0.00458 ± 0.00142	0.03893 ± 0.00752	0.88771 ± 0.03869	0.10495 ± 0.04372

Table C.1A-3 (continued)
Contributions to Organic Carbon at Core Sites for Individual Samples - NFRAQS Winter 1996/97, Extended Species CMB

Site ID	Date	Start Hour	Duration (hrs)	Meat Cooking	Wood Combustion (Softwood)	Wood Combustion (Hardwood)	Paved Road Dust	Ammonium Sulfate	Ammonium Nitrate	Coal-Fired Powerplant
BRIGHT	01/13/97	06	6	-99 ± -99	-0.01525 ± 0.00534	0.04766 ± 0.00335	0.08828 ± 0.03536	0 ± 0.00022	0 ± 0.00061	0 ± 0.00918
BRIGHT	01/13/97	12	6	-99 ± -99	-0.00017 ± 0.00006	0.06253 ± 0.0044	0.13731 ± 0.05499	0 ± 0.00035	0 ± 0.00084	0 ± 0.00319
BRIGHT	01/13/97	18	12	-99 ± -99	0.00962 ± 0.00337	0.15386 ± 0.01081	0.11915 ± 0.04772	0 ± 0.00032	0 ± 0.00104	0 ± 0.00414
BRIGHT	01/14/97	06	6	-0.2195 ± 0.01753	0.03989 ± 0.01397	0.4989 ± 0.03507	0.15894 ± 0.06366	0 ± 0.0005	0 ± 0.0012	0 ± 0.00028
BRIGHT	01/14/97	12	6	-0.1655 ± 0.01321	0.05074 ± 0.01777	-0.02291 ± 0.00161	0.0413 ± 0.01654	0 ± 0.00032	0 ± 0.00047	0 ± 0.00476
BRIGHT	01/14/97	18	12	-0.34013 ± 0.02716	0.06982 ± 0.02445	0.07537 ± 0.0053	0.06308 ± 0.02526	0 ± 0.00047	0 ± 0.00053	0 ± 0.00927
BRIGHT	01/15/97	06	6	-0.28388 ± 0.02267	0.01379 ± 0.00483	0.04115 ± 0.00289	0.14113 ± 0.05652	0 ± 0.00019	0 ± 0.00017	0 ± 0.00407
BRIGHT	01/15/97	12	6	0.28983 ± 0.02314	0.02285 ± 0.008	-0.00095 ± 0.00007	0.04092 ± 0.01639	0 ± 0.00016	0 ± 0.00022	0 ± 0.00185
BRIGHT	01/15/97	18	12	-0.06488 ± 0.00518	0.01077 ± 0.00377	-0.00626 ± 0.00044	0.04791 ± 0.01919	0 ± 0.00018	0 ± 0.00013	0 ± 0.00459
BRIGHT	01/16/97	06	6	-99 ± -99	0.00599 ± 0.0021	0.0068 ± 0.00048	0.05772 ± 0.02312	0 ± 0.00016	0 ± 0.00023	0 ± 0.01281
BRIGHT	01/16/97	12	6	-0.12675 ± 0.01012	0.03056 ± 0.0107	0.02667 ± 0.00187	0.09929 ± 0.03977	0 ± 0.0002	0 ± 0.00022	0 ± 0.00004
BRIGHT	01/16/97	18	12	-99 ± -99	0.11424 ± 0.04	0.11255 ± 0.00791	0.15784 ± 0.06322	0 ± 0.00027	0 ± 0.00059	0 ± 0.00771
BRIGHT	01/17/97	06	6	-99 ± -99	0.04929 ± 0.01726	0.29547 ± 0.02077	0.21601 ± 0.08652	0 ± 0.00053	0 ± 0.00115	0 ± 0.00204
BRIGHT	01/17/97	12	6	1.54587 ± 0.12342	0.21614 ± 0.07569	0.14198 ± 0.00998	0.119 ± 0.04766	0 ± 0.0004	0 ± 0.00168	0 ± 0.00264
BRIGHT	01/17/97	18	12	-99 ± -99	0.00124 ± 0.00043	0.13882 ± 0.00976	0.2498 ± 0.10005	0 ± 0.00026	0 ± 0.00088	0 ± 0.01172
BRIGHT	01/18/97	06	6	-99 ± -99	0.03245 ± 0.01136	0.09921 ± 0.00697	0.07313 ± 0.02929	0 ± 0.00004	0 ± 0.00017	0 ± 0.00219
BRIGHT	01/18/97	12	6	-99 ± -99	-0.00267 ± 0.00094	0.07128 ± 0.00501	0.05468 ± 0.0219	0 ± 0.00004	0 ± 0.00034	0 ± 0.00334
BRIGHT	01/18/97	18	12	-99 ± -99	0.10345 ± 0.03623	0.09964 ± 0.007	0.05871 ± 0.02351	0 ± 0.00005	0 ± 0.00038	0 ± 0.00378
BRIGHT	01/19/97	06	6	-99 ± -99	0.01887 ± 0.00661	0.03051 ± 0.00214	0.02708 ± 0.01084	0 ± 0.00004	0 ± 0.0003	0 ± 0.00729
BRIGHT	01/19/97	12	6	-0.25369 ± 0.02025	-0.00285 ± 0.001	-0.01888 ± 0.00133	0.12664 ± 0.05072	0 ± 0.00002	0 ± 0.00011	0 ± 0.00381
BRIGHT	01/19/97	18	12	-0.07101 ± 0.00567	0.00227 ± 0.0008	0.21234 ± 0.01493	0.06741 ± 0.027	0 ± 0.00016	0 ± 0.00118	0 ± 0.00592
BRIGHT	01/20/97	06	6	-99 ± -99	0.0075 ± 0.00263	0.14624 ± 0.01028	0.29642 ± 0.11872	0 ± 0.00004	0 ± 0.00015	0 ± 0.01238
BRIGHT	01/20/97	12	6	-99 ± -99	0.01884 ± 0.0066	0.08255 ± 0.0058	0.08326 ± 0.03334	0 ± 0.00003	0 ± 0.00038	0 ± 0.01346
BRIGHT	01/27/97	06	6	0.10234 ± 0.00817	0.01114 ± 0.0039	0.01698 ± 0.00119	0.0385 ± 0.01542	0 ± 0.00018	0 ± 0.00036	0 ± 0.00341
BRIGHT	01/27/97	12	6	0.73309 ± 0.05853	0.00018 ± 0.00006	0.0159 ± 0.00112	0.01434 ± 0.00574	0 ± 0.00011	0 ± 0.00013	0 ± 0.00269
BRIGHT	01/27/97	18	12	-99 ± -99	0.00375 ± 0.00131	0.09498 ± 0.00668	0.10187 ± 0.0408	0 ± 0.00016	0 ± 0.00045	0 ± 0.0068
BRIGHT	01/28/97	12	6	-99 ± -99	0.00857 ± 0.003	0.23054 ± 0.0162	0.18759 ± 0.07513	0 ± 0.00026	0 ± 0.00106	0 ± 0.00482
BRIGHT	01/28/97	18	12	0.25292 ± 0.02019	-0.01612 ± 0.00565	0.04003 ± 0.00281	0.01611 ± 0.00645	0 ± 0.00008	0 ± 0.00021	0 ± 0.00053
BRIGHT	01/29/97	06	6	1.50466 ± 0.12013	-0.00681 ± 0.00238	-0.0056 ± 0.00039	0.08021 ± 0.03213	0 ± 0.00014	0 ± 0.00032	0 ± 0.00645
BRIGHT	01/29/97	12	6	1.06075 ± 0.08469	0.01364 ± 0.00478	-0.02501 ± 0.00176	0.02007 ± 0.00804	0 ± 0.00015	0 ± 0.00019	0 ± 0.00139
BRIGHT	01/29/97	18	12	-99 ± -99	-0.00196 ± 0.00068	-0.0084 ± 0.00059	0.02234 ± 0.00895	0 ± 0.00009	0 ± 0.00009	0 ± 0.0029
BRIGHT	01/30/97	06	6	0.12729 ± 0.01016	0.00562 ± 0.00197	-0.00018 ± 0.00001	0.14783 ± 0.05921	0 ± 0.00003	0 ± 0.00014	0 ± 0.0158
BRIGHT	01/30/97	12	6	-99 ± -99	-0.00363 ± 0.00127	-0.00675 ± 0.00047	0.06773 ± 0.02713	0 ± 0.00001	0 ± 0.00005	0 ± 0.00867
BRIGHT	01/30/97	18	12	-99 ± -99	-0.00441 ± 0.00155	-0.00168 ± 0.00012	0.03202 ± 0.01282	0 ± 0.00002	0 ± 0.00002	0 ± 0.00405

Table C.1A-3 (continued)
Contributions to Organic Carbon at Core Sites for Individual Samples - NFRAQS Winter 1996/97, Extended Species CMB

Site ID	Date	Start Hour	Duration (hrs)	Organic Carbon (µg/m^3)	R-square	Chi-square	Percent of Mass	Incremental cold start ("puffers")	Hot stabilized, non-smoking	Smoking LDGV exhaust	Diesel Exhaust
WELBY	12/18/96	12	6	1.6652 ± 0.3475	0.90377	0.4508	107.705	-0.03842 ± 0.01193	0.25532 ± 0.04935	1.20356 ± 0.05246	0.13466 ± 0.0561
WELBY	12/19/96	06	6	6.0518 ± 0.6118	0.927	0.49731	112.131	0.26122 ± 0.08109	0.72092 ± 0.13935	3.7707 ± 0.16435	0.48749 ± 0.20309
WELBY	12/19/96	12	6	5.4806 ± 0.5664	0.93103	0.42077	94.2949	0.71388 ± 0.22162	0.54243 ± 0.10485	3.34739 ± 0.1459	0.55356 ± 0.23062
WELBY	12/19/96	18	12	3.7762 ± 0.3556	0.87751	0.8296	98.3231	1.14983 ± 0.35696	0.63415 ± 0.12258	-0.59874 ± 0.0261	0.32411 ± 0.13503
WELBY	12/20/96	06	6	5.332 ± 0.5618	0.89281	0.57922	107.337	2.62313 ± 0.81434	0.89227 ± 0.17247	-0.91434 ± 0.03985	0.45584 ± 0.18991
WELBY	12/25/96	06	6	2.0848 ± 0.3702	0.93949	0.28542	105.787	0.00867 ± 0.00269	0.11043 ± 0.02135	1.80001 ± 0.07845	0.19418 ± 0.0809
WELBY	12/25/96	12	6	1.6754 ± 0.3581	0.86983	0.39052	123.483	-0.05073 ± 0.01575	0.10728 ± 0.02074	1.62312 ± 0.07074	0.05263 ± 0.02192
WELBY	12/25/96	18	12	0.7353 ± 0.1747	0.96283	0.1544	91.588	-0.08032 ± 0.02494	0.01051 ± 0.00203	0.67305 ± 0.02934	0.07802 ± 0.0325
WELBY	12/30/96	06	6	2.7404 ± 0.4004	0.82721	0.7915	135.081	0.6592 ± 0.20465	0.6057 ± 0.11708	0.67778 ± 0.02954	0.27081 ± 0.11282
WELBY	12/30/96	12	6	3.9454 ± 0.4718	0.89613	0.48401	115.822	1.10143 ± 0.34193	0.298 ± 0.0576	1.11986 ± 0.04881	0.61599 ± 0.25663
WELBY	12/30/96	18	12	4.6982 ± 0.42	0.93275	0.40653	102.551	1.07545 ± 0.33387	0.1602 ± 0.03097	2.29681 ± 0.10011	0.48355 ± 0.20145
WELBY	12/31/96	06	6	4.5237 ± 0.5056	0.92342	0.38811	103.39	-0.18056 ± 0.05605	0.06496 ± 0.01256	3.13407 ± 0.1366	0.96337 ± 0.40135
WELBY	12/31/96	12	6	3.756 ± 0.4521	0.86193	0.65173	122.643	1.14236 ± 0.35464	0.23154 ± 0.04476	1.53113 ± 0.06673	0.22065 ± 0.09193
WELBY	12/31/96	18	12	5.8167 ± 0.5055	0.84326	0.98928	102.979	1.66241 ± 0.51609	0.09049 ± 0.01749	-99 ± -99	0.37552 ± 0.15644
WELBY	01/01/97	06	6	2.5612 ± 0.3876	0.80837	0.87535	116.785	1.77688 ± 0.55163	0.57968 ± 0.11205	-99 ± -99	-0.1327 ± 0.05528
WELBY	01/01/97	12	6	4.3043 ± 0.4872	0.91336	0.48448	110.43	1.6407 ± 0.50935	0.61863 ± 0.11958	0.22809 ± 0.00994	0.1538 ± 0.06407
WELBY	01/01/97	18	12	4.6369 ± 0.4151	0.86078	1.07183	111.064	-99 ± -99	0.73185 ± 0.14146	0.26243 ± 0.01144	0.40503 ± 0.16874
WELBY	01/02/97	06	6	6.8763 ± 0.6592	0.94831	0.30692	109.491	2.75576 ± 0.85551	0.78856 ± 0.15243	-99 ± -99	1.09324 ± 0.45546
WELBY	01/02/97	12	6	4.3957 ± 0.4927	0.91639	0.45934	111.9	0.31165 ± 0.09675	0.38446 ± 0.07431	1.57044 ± 0.06845	0.45117 ± 0.18796
WELBY	01/02/97	18	12	3.6688 ± 0.3445	0.92603	0.43418	103.929	1.41119 ± 0.4381	0.50848 ± 0.09829	-99 ± -99	0.42095 ± 0.17537
WELBY	01/06/97	06	6	1.2386 ± 0.3249	0.9035	0.44255	97.7999	0.44685 ± 0.13872	0.07116 ± 0.01376	-99 ± -99	0.03993 ± 0.01663
WELBY	01/06/97	12	6	2.0811 ± 0.368	0.93675	0.30957	83.4631	0.77116 ± 0.2394	0.11026 ± 0.02131	-1.03259 ± 0.04501	0.07517 ± 0.03132
WELBY	01/06/97	18	12	3.8769 ± 0.3614	0.91765	0.56058	98.0311	0.00527 ± 0.00164	0.03941 ± 0.00762	2.0195 ± 0.08802	0.42839 ± 0.17847
WELBY	01/07/97	06	6	6.5959 ± 0.6422	0.89877	0.59799	94.7872	2.2169 ± 0.68823	0.71867 ± 0.13892	1.43454 ± 0.06252	0.37565 ± 0.1565
WELBY	01/07/97	12	6	3.6268 ± 0.4502	0.90564	0.53508	98.332	0.21856 ± 0.06785	0.15835 ± 0.03061	2.05757 ± 0.08968	0.37326 ± 0.15551
WELBY	01/07/97	18	12	2.4148 ± 0.2609	0.95372	0.26338	84.4171	0.92247 ± 0.28638	0.44667 ± 0.08634	0.60278 ± 0.02627	0.01401 ± 0.00584
WELBY	01/08/97	06	6	5.2527 ± 0.5504	0.92051	0.48359	129.5	2.27481 ± 0.70621	0.54471 ± 0.10529	1.16764 ± 0.05089	0.51665 ± 0.21524
WELBY	01/12/97	06	6	1.3901 ± 0.4023	0.89251	0.43755	103.997	0.55801 ± 0.17323	0.43381 ± 0.08385	-99 ± -99	0.01997 ± 0.00832
WELBY	01/12/97	12	6	0.6298 ± 0.3621	0.90861	0.41414	89.8276	0.48523 ± 0.15064	0.19942 ± 0.03855	-0.02823 ± 0.00123	-0.01547 ± 0.00645
WELBY	01/12/97	18	12	2.7642 ± 0.281	0.89666	0.68482	99.207	0.54924 ± 0.17051	0.09581 ± 0.01852	1.92539 ± 0.08392	0.12551 ± 0.05229
WELBY	01/13/97	06	6	2.4367 ± 0.3722	0.96316	0.19794	94.5547	0.17813 ± 0.0553	0.1316 ± 0.02544	3.41592 ± 0.14888	0.12944 ± 0.05393
WELBY	01/13/97	12	6	4.1713 ± 0.4826	0.97159	0.14584	88.7075	-0.23982 ± 0.07445	-0.02211 ± 0.00427	2.80203 ± 0.12213	0.36118 ± 0.15047
WELBY	01/13/97	18	12	4.2634 ± 0.3868	0.96819	0.19145	90.2272	0.40359 ± 0.12529	0.07314 ± 0.01414	3.24201 ± 0.1413	0.20366 ± 0.08485
WELBY	01/14/97	12	6	5.0439 ± 0.534	0.97175	0.18661	96.2249	0.56257 ± 0.17465	0.17153 ± 0.03315	3.80871 ± 0.166	0.37475 ± 0.15613
WELBY	01/14/97	18	12	4.324 ± 0.3931	0.92315	0.47248	100.198	0.5103 ± 0.15842	0.09435 ± 0.01824	1.50817 ± 0.06573	0.1892 ± 0.07882

Table C.1A-3 (continued)
Contributions to Organic Carbon at Core Sites for Individual Samples - NFRAQS Winter 1996/97, Extended Species CMB

Site ID	Date	Start Hour	Duration (hrs)	Meat Cooking	Wood Combustion (Softwood)	Wood Combustion (Hardwood)	Paved Road Dust	Ammonium Sulfate	Ammonium Nitrate	Coal-Fired Powerplant
WELBY	12/18/96	12	6	0.06168 ± 0.00492	0.06747 ± 0.02363	0.01317 ± 0.00093	0.05027 ± 0.02014	0 ± 0.00006	0 ± 0.00012	0 ± 0.00643
WELBY	12/19/96	06	6	-99 ± -99	0.31791 ± 0.11133	0.14674 ± 0.01031	0.26579 ± 0.10645	0 ± 0.00022	0 ± 0.00043	0 ± 0.00421
WELBY	12/19/96	12	6	-99 ± -99	0.03311 ± 0.01159	0.02444 ± 0.00172	0.24238 ± 0.09708	0 ± 0.00032	0 ± 0.00099	0 ± 0.01689
WELBY	12/19/96	18	12	2.01823 ± 0.16114	0.02279 ± 0.00798	0.16457 ± 0.01157	0.14495 ± 0.05805	0 ± 0.00017	0 ± 0.00029	0 ± 0.00736
WELBY	12/20/96	06	6	0.39723 ± 0.03171	0.10141 ± 0.03551	1.32766 ± 0.09332	0.39474 ± 0.1581	0 ± 0.00012	0 ± 0.00024	0 ± 0.00847
WELBY	12/25/96	06	6	-0.09931 ± 0.00793	0.03665 ± 0.01283	-0.01219 ± 0.00086	0.07416 ± 0.0297	0 ± 0.00005	0 ± 0.00014	0 ± 0.00879
WELBY	12/25/96	12	6	-99 ± -99	0.05299 ± 0.01856	-0.06862 ± 0.00482	0.10057 ± 0.04028	0 ± 0.00003	0 ± 0.00006	0 ± 0.00329
WELBY	12/25/96	18	12	-99 ± -99	0.04454 ± 0.0156	-0.0208 ± 0.00146	0.06035 ± 0.02417	0 ± 0.00023	0 ± 0.00048	0 ± 0.00135
WELBY	12/30/96	06	6	0.00525 ± 0.00042	0.1659 ± 0.05809	0.26577 ± 0.01868	0.22797 ± 0.0913	0 ± 0.00002	0 ± 0.00009	0 ± 0.01211
WELBY	12/30/96	12	6	-99 ± -99	0.01262 ± 0.00442	0.41538 ± 0.0292	0.47201 ± 0.18905	0 ± 0.00006	0 ± 0.0001	0 ± 0.01539
WELBY	12/30/96	18	12	-99 ± -99	0.19876 ± 0.0696	0.20706 ± 0.01455	0.2486 ± 0.09957	0 ± 0.00007	0 ± 0.00014	0 ± 0.00201
WELBY	12/31/96	06	6	-99 ± -99	0.07977 ± 0.02793	0.13757 ± 0.00967	0.46409 ± 0.18587	0 ± 0.00013	0 ± 0.00042	0 ± 0.02993
WELBY	12/31/96	12	6	-99 ± -99	0.03356 ± 0.01175	0.43452 ± 0.03054	0.32394 ± 0.12974	0 ± 0.00006	0 ± 0.00008	0 ± 0.01021
WELBY	12/31/96	18	12	1.29903 ± 0.10372	0.37531 ± 0.13143	2.22234 ± 0.15621	0.23627 ± 0.09463	0 ± 0.00007	0 ± 0.0001	0 ± 0.03883
WELBY	01/01/97	06	6	-99 ± -99	0.32536 ± 0.11394	0.73957 ± 0.05198	0.08876 ± 0.03555	0 ± 0.00003	0 ± 0.00012	0 ± 0.01891
WELBY	01/01/97	12	6	0.98523 ± 0.07866	-0.03579 ± 0.01253	0.60805 ± 0.04274	0.27973 ± 0.11203	0 ± 0.00008	0 ± 0.00056	0 ± 0.00578
WELBY	01/01/97	18	12	-99 ± -99	0.97023 ± 0.33976	2.47615 ± 0.17404	0.22374 ± 0.08961	0 ± 0.00007	0 ± 0.00015	0 ± 0.00528
WELBY	01/02/97	06	6	1.15558 ± 0.09226	0.27732 ± 0.09711	0.83694 ± 0.05883	0.61924 ± 0.24801	0 ± 0.0002	0 ± 0.00029	0 ± 0.03145
WELBY	01/02/97	12	6	0.96954 ± 0.07741	0.03779 ± 0.01323	0.14473 ± 0.01017	0.45816 ± 0.1835	0 ± 0.00008	0 ± 0.0001	0 ± 0.02011
WELBY	01/02/97	18	12	1.36584 ± 0.10905	0.24442 ± 0.08559	0.10287 ± 0.00723	0.19862 ± 0.07955	0 ± 0.00006	0 ± 0.00012	0 ± 0.01032
WELBY	01/06/97	06	6	0.57716 ± 0.04608	0.34026 ± 0.11915	-0.06993 ± 0.00492	0.04605 ± 0.01844	0 ± 0.00008	0 ± 0.00033	0 ± 0.00318
WELBY	01/06/97	12	6	1.87999 ± 0.1501	0.15736 ± 0.0551	-0.00385 ± 0.00027	0.23968 ± 0.09599	0 ± 0.00017	0 ± 0.00054	0 ± 0.01404
WELBY	01/06/97	18	12	1.24609 ± 0.09949	0.00914 ± 0.0032	-0.0221 ± 0.00155	0.2986 ± 0.11959	0 ± 0.00012	0 ± 0.00022	0 ± 0.00123
WELBY	01/07/97	06	6	-99 ± -99	0.44845 ± 0.15704	0.50892 ± 0.03577	1.08797 ± 0.43574	0 ± 0.00014	0 ± 0.00032	0 ± 0.00241
WELBY	01/07/97	12	6	-99 ± -99	0.0123 ± 0.00431	0.05526 ± 0.00388	0.81696 ± 0.3272	0 ± 0.0001	0 ± 0.0006	0 ± 0.00325
WELBY	01/07/97	18	12	0.06512 ± 0.0052	0.02581 ± 0.00904	0.03089 ± 0.00217	0.31007 ± 0.12419	0 ± 0.00008	0 ± 0.00033	0 ± 0.00437
WELBY	01/08/97	06	6	-99 ± -99	0.02761 ± 0.00967	0.68453 ± 0.04811	0.30138 ± 0.1207	0 ± 0.00018	0 ± 0.00086	0 ± 0.00032
WELBY	01/12/97	06	6	-99 ± -99	0.09093 ± 0.03184	0.08594 ± 0.00604	0.03413 ± 0.01367	0 ± 0.00007	0 ± 0.0001	0 ± 0.00076
WELBY	01/12/97	12	6	-99 ± -99	0.10871 ± 0.03807	0.02751 ± 0.00193	0.03738 ± 0.01497	0 ± 0.0001	0 ± 0.00015	0 ± 0.00699
WELBY	01/12/97	18	12	-99 ± -99	0.04286 ± 0.01501	-0.00104 ± 0.00007	0.09573 ± 0.03834	0 ± 0.00014	0 ± 0.00038	0 ± 0.00959
WELBY	01/13/97	06	6	-1.43119 ± 0.11427	-0.0072 ± 0.00252	0.01957 ± 0.00138	0.06264 ± 0.02509	0 ± 0.00019	0 ± 0.00049	0 ± 0.00507
WELBY	01/13/97	12	6	1.02771 ± 0.08205	0.06662 ± 0.02333	0.01908 ± 0.00134	0.10981 ± 0.04398	0 ± 0.00043	0 ± 0.00101	0 ± 0.00433
WELBY	01/13/97	18	12	-99 ± -99	0.28319 ± 0.09917	0.0019 ± 0.00013	0.08243 ± 0.03302	0 ± 0.00029	0 ± 0.00099	0 ± 0.01338
WELBY	01/14/97	12	6	-99 ± -99	0.01863 ± 0.00652	0.04387 ± 0.00308	0.0992 ± 0.03973	0 ± 0.00061	0 ± 0.00079	0 ± 0.01056
WELBY	01/14/97	18	12	-99 ± -99	1.8452 ± 0.64616	0.23019 ± 0.01618	0.10149 ± 0.04065	0 ± 0.00056	0 ± 0.00055	0 ± 0.01426

Table C.1A-3 (continued)
Contributions to Organic Carbon at Core Sites for Individual Samples - NFRAQS Winter 1996/97, Extended Species CMB

Site ID	Date	Start Hour	Duration (hrs)	Organic Carbon (µg/m^3)	R-square	Chi-square	Percent of Mass	Incremental cold start ("puffers")	Hot stabilized, non-smoking	Smoking LDGV exhaust	Diesel Exhaust
WELBY	01/15/97	06	6	2.2385 ± 0.3664	0.94173	0.33316	99.2222	0.18933 ± 0.05878	0.22305 ± 0.04312	2.54596 ± 0.11097	0.20864 ± 0.08692
WELBY	01/15/97	12	6	2.7757 ± 0.3976	0.96084	0.18988	123.885	-0.22434 ± 0.06964	0.13638 ± 0.02636	2.53983 ± 0.1107	0.22874 ± 0.0953
WELBY	01/15/97	18	12	1.4972 ± 0.2064	0.94194	0.35036	112.472	0.63471 ± 0.19704	0.27378 ± 0.05292	0.42198 ± 0.01839	-0.04237 ± 0.01765
WELBY	01/16/97	06	6	2.5021 ± 0.3828	0.96029	0.21541	102.041	-0.10062 ± 0.03124	0.05201 ± 0.01005	3.10226 ± 0.13521	0.25607 ± 0.10668
WELBY	01/16/97	12	6	3.1655 ± 0.4166	0.95238	0.23834	100.645	-0.29016 ± 0.09008	0.04812 ± 0.0093	3.01166 ± 0.13126	0.18636 ± 0.07764
WELBY	01/16/97	18	12	6.4448 ± 0.5511	0.9608	0.23393	95.0494	-0.25984 ± 0.08067	0.02417 ± 0.00467	5.5615 ± 0.2424	0.76487 ± 0.31865
WELBY	01/17/97	06	6	13.4238 ± 1.1453	0.95678	0.31214	92.9989	1.77834 ± 0.55208	0.47614 ± 0.09203	6.09469 ± 0.26564	1.37889 ± 0.57446
WELBY	01/17/97	12	6	3.5771 ± 0.4398	0.97467	0.13371	100.367	0.70994 ± 0.2204	0.31964 ± 0.06179	1.48273 ± 0.06463	0.29172 ± 0.12154
WELBY	01/17/97	18	12	5.9428 ± 0.5128	0.92174	0.41368	90.7253	-0.48467 ± 0.15046	-0.09495 ± 0.01835	5.69679 ± 0.2483	0.84527 ± 0.35215
WELBY	01/18/97	06	6	5.2032 ± 0.5527	0.88225	0.71666	101.6	1.32275 ± 0.41064	0.74826 ± 0.14464	1.34711 ± 0.05871	0.31943 ± 0.13308
WELBY	01/18/97	12	6	5.4466 ± 0.5673	0.92851	0.44392	106.712	1.0116 ± 0.31405	0.54272 ± 0.1049	1.1197 ± 0.0488	0.49545 ± 0.20641
WELBY	01/18/97	18	12	5.2059 ± 0.4574	0.9265	0.40892	87.0254	2.13422 ± 0.66256	0.40352 ± 0.078	-0.69362 ± 0.03023	0.06091 ± 0.02538
WELBY	01/19/97	06	6	4.6976 ± 0.5147	0.93111	0.398	109.711	0.81876 ± 0.25418	0.20745 ± 0.0401	2.72241 ± 0.11866	0.13963 ± 0.05817
WELBY	01/19/97	12	6	4.3862 ± 0.4868	0.8556	0.75814	161.401	0.26355 ± 0.08182	0.46015 ± 0.08894	3.52133 ± 0.15348	0.0763 ± 0.03179
WELBY	01/19/97	18	12	6.5322 ± 0.5579	0.93462	0.31834	97.0529	2.33688 ± 0.72548	0.35244 ± 0.06813	0.0149 ± 0.00065	0.23557 ± 0.09814
WELBY	01/20/97	06	6	5.5291 ± 0.5736	0.86794	0.62028	96.7564	2.80547 ± 0.87095	0.46917 ± 0.09069	0.97014 ± 0.04228	0.44369 ± 0.18485
WELBY	01/20/97	12	6	4.1927 ± 0.4773	0.91992	0.45569	120.114	0.56136 ± 0.17427	0.32071 ± 0.06199	2.67361 ± 0.11653	0.33216 ± 0.13838
WELBY	01/20/97	18	12	2.9328 ± 0.2965	0.91287	0.44615	145.254	1.85146 ± 0.57478	0.27869 ± 0.05387	-0.05527 ± 0.00241	0.17958 ± 0.07481
WELBY	01/27/97	06	6	2.8143 ± 0.3978	0.92769	0.38307	81.1228	1.95233 ± 0.60609	0.29473 ± 0.05697	0.31298 ± 0.01364	-0.13215 ± 0.05505
WELBY	01/27/97	12	6	2.1201 ± 0.3605	0.9747	0.13531	91.3311	0.10332 ± 0.03208	0.00845 ± 0.00163	1.74679 ± 0.07613	0.17287 ± 0.07202
WELBY	01/27/97	18	12	2.935 ± 0.2945	0.94889	0.30045	98.213	0.63608 ± 0.19747	-0.06566 ± 0.01269	1.80501 ± 0.07867	0.27448 ± 0.11435
WELBY	01/28/97	06	6	3.8642 ± 0.4587	0.91079	0.418	89.1911	0.03966 ± 0.01231	0.02952 ± 0.00571	2.42838 ± 0.10584	0.54809 ± 0.22834
WELBY	01/28/97	12	6	4.6596 ± 0.5053	0.95414	0.23169	78.7171	1.1584 ± 0.35962	0.15185 ± 0.02935	1.69021 ± 0.07367	0.48629 ± 0.20259
WELBY	01/28/97	18	12	3.2517 ± 0.3168	0.97067	0.1569	100.184	1.23886 ± 0.3846	0.07664 ± 0.01481	1.32982 ± 0.05796	0.12467 ± 0.05194
WELBY	01/29/97	06	6	3.2298 ± 0.4197	0.96425	0.21505	94.574	0.43835 ± 0.13608	0.10407 ± 0.02012	2.24943 ± 0.09804	0.37569 ± 0.15652
WELBY	01/29/97	12	6	1.892 ± 0.3513	0.97446	0.12382	123.225	0.24134 ± 0.07492	-0.03967 ± 0.00767	1.49204 ± 0.06503	0.10086 ± 0.04202
WELBY	01/29/97	18	12	2.1887 ± 0.2512	0.93998	0.36747	87.8062	0.65558 ± 0.20352	0.05185 ± 0.01002	1.04167 ± 0.0454	0.1742 ± 0.07257
WELBY	01/30/97	06	6	5.7694 ± 0.5778	0.78205	0.98648	105.349	2.57506 ± 0.79942	0.49329 ± 0.09535	-0.3495 ± 0.01523	0.57268 ± 0.23859
WELBY	01/30/97	12	6	3.2353 ± 0.4184	0.90064	0.34547	182.476	-0.00341 ± 0.00106	0.26406 ± 0.05104	1.95175 ± 0.08507	0.19488 ± 0.08119
WELBY	01/30/97	18	12	1.5851 ± 0.2056	0.87477	0.46159	169.321	0.01741 ± 0.00541	0.15488 ± 0.02994	0.81512 ± 0.03553	0.03844 ± 0.01601

Table C.1A-3 (continued)
Contributions to Organic Carbon at Core Sites for Individual Samples - NFRAQS Winter 1996/97, Extended Species CMB

Site ID	Date	Start Hour	Duration (hrs)	Meat Cooking	Wood Combustion (Softwood)	Wood Combustion (Hardwood)	Paved Road Dust	Ammonium Sulfate	Ammonium Nitrate	Coal-Fired Powerplant
WELBY	01/15/97	06	6	-0.95542 ± 0.07628	-0.0034 ± 0.00119	0.02003 ± 0.00141	0.08411 ± 0.03369	0 ± 0.00014	0 ± 0.00013	0 ± 0.00059
WELBY	01/15/97	12	6	-99 ± -99	0.01206 ± 0.00422	-0.00093 ± 0.00007	0.05266 ± 0.02109	0 ± 0.00013	0 ± 0.00015	0 ± 0.00231
WELBY	01/15/97	18	12	0.06942 ± 0.00554	0.05214 ± 0.01826	0.06411 ± 0.00451	0.05061 ± 0.02027	0 ± 0.00018	0 ± 0.00013	0 ± 0.001
WELBY	01/16/97	06	6	-0.91447 ± 0.07301	-0.00296 ± 0.00104	0.01157 ± 0.00081	0.14876 ± 0.05958	0 ± 0.00021	0 ± 0.00023	0 ± 0.00166
WELBY	01/16/97	12	6	-0.14753 ± 0.01178	0.02584 ± 0.00905	-0.01281 ± 0.0009	0.385 ± 0.1542	0 ± 0.00018	0 ± 0.00024	0 ± 0.00733
WELBY	01/16/97	18	12	-0.19866 ± 0.01586	-0.01782 ± 0.00624	-0.01828 ± 0.00129	0.48775 ± 0.19535	0 ± 0.00033	0 ± 0.00073	0 ± 0.00426
WELBY	01/17/97	06	6	2.06254 ± 0.16467	0.05287 ± 0.01851	0.95652 ± 0.06723	0.53353 ± 0.21368	0 ± 0.00068	0 ± 0.00137	0 ± 0.00076
WELBY	01/17/97	12	6	0.60917 ± 0.04864	0.01838 ± 0.00644	-0.03599 ± 0.00253	0.21121 ± 0.08459	0 ± 0.00027	0 ± 0.00111	0 ± 0.0086
WELBY	01/17/97	18	12	-0.53641 ± 0.04283	-0.0116 ± 0.00406	-0.02462 ± 0.00173	0.35531 ± 0.1423	0 ± 0.00023	0 ± 0.00081	0 ± 0.01057
WELBY	01/18/97	06	6	0.92728 ± 0.07404	0.16104 ± 0.05639	0.05563 ± 0.00391	0.44191 ± 0.17699	0 ± 0.00007	0 ± 0.00036	0 ± 0.00168
WELBY	01/18/97	12	6	1.43927 ± 0.11491	-0.03055 ± 0.0107	0.5925 ± 0.04165	0.33839 ± 0.13553	0 ± 0.00007	0 ± 0.00064	0 ± 0.00724
WELBY	01/18/97	18	12	1.73399 ± 0.13844	0.53476 ± 0.18726	1.01711 ± 0.07149	0.08525 ± 0.03414	0 ± 0.00006	0 ± 0.00035	0 ± 0.00582
WELBY	01/19/97	06	6	0.47569 ± 0.03798	0.09651 ± 0.0338	-0.00407 ± 0.00029	0.17349 ± 0.06948	0 ± 0.00006	0 ± 0.00021	0 ± 0.01075
WELBY	01/19/97	12	6	-99 ± -99	-0.00389 ± 0.00136	0.05244 ± 0.00369	0.08596 ± 0.03443	0 ± 0.00004	0 ± 0.00012	0 ± 0.01152
WELBY	01/19/97	18	12	2.50444 ± 0.19996	0.11301 ± 0.03957	0.82391 ± 0.05791	0.19552 ± 0.07831	0 ± 0.00004	0 ± 0.00015	0 ± 0.0025
WELBY	01/20/97	06	6	0.07853 ± 0.00627	0.04874 ± 0.01707	0.41312 ± 0.02904	0.3258 ± 0.13048	0 ± 0.00005	0 ± 0.00022	0 ± 0.03197
WELBY	01/20/97	12	6	-99 ± -99	0.0079 ± 0.00277	0.01823 ± 0.00128	0.2178 ± 0.08723	0 ± 0.00005	0 ± 0.00017	0 ± 0.01716
WELBY	01/20/97	18	12	-99 ± -99	-0.01084 ± 0.0038	0.58976 ± 0.04145	0.07695 ± 0.03082	0 ± 0.00007	0 ± 0.00028	0 ± 0.00466
WELBY	01/27/97	06	6	-99 ± -99	0.23082 ± 0.08083	0.08324 ± 0.00585	0.17349 ± 0.06948	0 ± 0.00026	0 ± 0.0005	0 ± 0.00771
WELBY	01/27/97	12	6	-99 ± -99	-0.02357 ± 0.00825	0.01386 ± 0.00097	0.05204 ± 0.02084	0 ± 0.0002	0 ± 0.00034	0 ± 0.00122
WELBY	01/27/97	18	12	-99 ± -99	0.09264 ± 0.03244	0.04483 ± 0.00315	0.10642 ± 0.04262	0 ± 0.00022	0 ± 0.00049	0 ± 0.01113
WELBY	01/28/97	06	6	-99 ± -99	-0.05173 ± 0.01811	0.00185 ± 0.00013	0.84398 ± 0.33802	0 ± 0.00006	0 ± 0.00021	0 ± 0.03196
WELBY	01/28/97	12	6	-99 ± -99	-0.05035 ± 0.01763	0.01324 ± 0.00093	1.2381 ± 0.49587	0 ± 0.00012	0 ± 0.00061	0 ± 0.01847
WELBY	01/28/97	18	12	-99 ± -99	-0.00309 ± 0.00108	0.02259 ± 0.00159	0.45524 ± 0.18233	0 ± 0.00012	0 ± 0.00032	0 ± 0.00209
WELBY	01/29/97	06	6	-99 ± -99	-0.03129 ± 0.01096	0.02373 ± 0.00167	0.0833 ± 0.03336	0 ± 0.0002	0 ± 0.00063	0 ± 0.00368
WELBY	01/29/97	12	6	-99 ± -99	-0.01792 ± 0.00628	-0.00083 ± 0.00006	0.09227 ± 0.03695	0 ± 0.00018	0 ± 0.00027	0 ± 0.00294
WELBY	01/29/97	18	12	0.08554 ± 0.00683	0.02274 ± 0.00796	0.00443 ± 0.00031	0.08128 ± 0.03255	0 ± 0.00011	0 ± 0.00014	0 ± 0.00513
WELBY	01/30/97	06	6	0.76065 ± 0.06073	0.04123 ± 0.01444	0.97734 ± 0.0687	0.78447 ± 0.31419	0 ± 0.00007	0 ± 0.00016	0 ± 0.02451
WELBY	01/30/97	12	6	0.60482 ± 0.04829	-0.00144 ± 0.00051	0.05522 ± 0.00388	0.15573 ± 0.06237	0 ± 0.00001	0 ± 0.00003	0 ± 0.01492
WELBY	01/30/97	18	12	0.48423 ± 0.03866	-0.01237 ± 0.00433	0.02392 ± 0.00168	0.04411 ± 0.01767	0 ± 0.00002	0 ± 0.00001	0 ± 0.00127

Table C.1A-4
Contributions to Elemental Carbon at Core Sites for Individual Samples - NFRAQS Winter 1996/97, Extended Species CMB

Site ID	Date	Start Hour	Duration (hrs)	Elemental Carbon (µg/m^3)	R-square	Chi-square	Percent of Mass	Incremental cold start ("puffers")	Hot stabilized, non-smoking	Smoking LDGV exhaust	Diesel Exhaust
BRIGHT	12/18/96	06	6	1.2497 ± 0.2278	0.94696	0.24884	107.156	-0.12548 ± 0.04203	0.01629 ± 0.00945	0.24781 ± 0.12103	1.06002 ± 0.14511
BRIGHT	12/18/96	12	6	0.3232 ± 0.2491	0.86814	0.4292	67.2689	-0.03906 ± 0.01309	0.01866 ± 0.01082	0.12268 ± 0.05991	0.21572 ± 0.02953
BRIGHT	12/18/96	18	12	1.7239 ± 0.1902	0.91877	0.55765	174.449	0.06727 ± 0.02254	0.0301 ± 0.01745	0.1625 ± 0.07936	1.30284 ± 0.17835
BRIGHT	12/19/96	06	6	2.0234 ± 0.2827	0.90093	0.71493	97.5913	0.39858 ± 0.13352	0.09409 ± 0.05456	0.30976 ± 0.15128	1.01511 ± 0.13896
BRIGHT	12/19/96	12	6	3.1899 ± 0.3623	0.95264	0.28973	87.797	0.66458 ± 0.22263	0.15287 ± 0.08864	0.31002 ± 0.15141	1.955 ± 0.26763
BRIGHT	12/19/96	18	12	1.0251 ± 0.1417	0.95264	0.27804	97.5091	0.16211 ± 0.05431	0.06775 ± 0.03929	0.08578 ± 0.04189	0.63121 ± 0.08641
BRIGHT	12/20/96	06	6	1.0726 ± 0.2311	0.94627	0.1404	98.4816	-0.17597 ± 0.05895	0.00728 ± 0.00422	0.13429 ± 0.06558	0.96735 ± 0.13243
BRIGHT	12/25/96	06	6	0.2922 ± 0.2343	0.82737	0.3782	122.389	0.00778 ± 0.00261	0.0386 ± 0.02238	0.10822 ± 0.05285	0.22547 ± 0.03087
BRIGHT	12/25/96	12	6	0.149 ± 0.2471	0.86192	0.49436	116.647	-0.02847 ± 0.00954	0.02061 ± 0.01195	0.08737 ± 0.04267	0.07732 ± 0.01058
BRIGHT	12/25/96	18	12	0.2232 ± 0.1325	0.90966	0.38346	111.531	0.02269 ± 0.0076	0.00106 ± 0.00061	0.01983 ± 0.00968	0.17428 ± 0.02386
BRIGHT	12/26/96	06	6	0.6059 ± 0.2194	0.95011	0.23806	85.5113	0.04269 ± 0.0143	0.00288 ± 0.00167	0.10905 ± 0.05326	0.38534 ± 0.05275
BRIGHT	12/26/96	12	6	0.5221 ± 0.2793	0.91168	0.4276	114.996	0.08219 ± 0.02753	0.02128 ± 0.01234	0.00594 ± 0.0029	0.2878 ± 0.0394
BRIGHT	12/26/96	18	12	0.4946 ± 0.1152	0.94882	0.26857	120.921	0.09692 ± 0.03247	0.02584 ± 0.01498	0.04024 ± 0.01965	0.31937 ± 0.04372
BRIGHT	12/30/96	06	6	1.0618 ± 0.2328	0.90027	0.34308	107.852	0.03683 ± 0.01234	0.08964 ± 0.05198	0.04193 ± 0.02048	0.80723 ± 0.11051
BRIGHT	12/30/96	12	6	0.9743 ± 0.2302	0.8281	0.45871	97.5083	-0.07646 ± 0.02561	0.0951 ± 0.05514	0.0456 ± 0.02227	0.89061 ± 0.12192
BRIGHT	12/30/96	18	12	0.9443 ± 0.1364	0.91522	0.48103	109.215	0.14811 ± 0.04962	0.03417 ± 0.01981	0.04096 ± 0.02	0.64234 ± 0.08793
BRIGHT	12/31/96	06	6	2.001 ± 0.2822	0.95116	0.21564	108.314	-0.20292 ± 0.06798	0.00416 ± 0.00241	0.23474 ± 0.11464	1.82828 ± 0.25028
BRIGHT	12/31/96	12	6	1.5808 ± 0.2545	0.92289	0.39994	134.718	0.03957 ± 0.01326	0.02866 ± 0.01662	0.10801 ± 0.05275	1.23282 ± 0.16877
BRIGHT	12/31/96	18	12	1.1487 ± 0.1492	0.88751	0.5466	117.748	0.22137 ± 0.07416	0.0307 ± 0.0178	0.09546 ± 0.04662	0.67504 ± 0.09241
BRIGHT	01/01/97	06	6	0.3645 ± 0.2457	0.89792	0.39318	113.824	0.31383 ± 0.10513	0.04203 ± 0.02437	0.05698 ± 0.02783	-0.05922 ± 0.00811
BRIGHT	01/01/97	12	6	1.6701 ± 0.2601	0.87896	0.65062	134.745	0.22501 ± 0.07538	0.01894 ± 0.01098	0.2036 ± 0.09943	1.11303 ± 0.15237
BRIGHT	01/01/97	18	12	0.9232 ± 0.1355	0.92624	0.41979	127.122	0.07603 ± 0.02547	0.03234 ± 0.01875	0.11779 ± 0.05753	0.63786 ± 0.08732
BRIGHT	01/02/97	06	6	1.5622 ± 0.2562	0.90415	0.30344	110.666	0.14308 ± 0.04793	0.06481 ± 0.03758	0.16343 ± 0.07982	1.08245 ± 0.14818
BRIGHT	01/02/97	12	6	1.1218 ± 0.2327	0.88166	0.41006	142.416	-0.05295 ± 0.01774	0.08501 ± 0.04929	0.15652 ± 0.07644	0.79569 ± 0.10893
BRIGHT	01/02/97	18	12	1.2384 ± 0.1548	0.94117	0.30128	156.115	0.24069 ± 0.08063	0.03208 ± 0.0186	0.09998 ± 0.04883	0.80535 ± 0.11025
BRIGHT	01/06/97	06	6	0.4204 ± 0.2581	0.91285	0.28958	109.72	-99 ± -99	0.11365 ± 0.0659	0.01591 ± 0.00777	0.10621 ± 0.01454
BRIGHT	01/06/97	12	6	0.7734 ± 0.2193	0.97759	0.08534	110.339	-0.14291 ± 0.04787	0.00674 ± 0.00391	0.11051 ± 0.05397	0.748 ± 0.1024
BRIGHT	01/06/97	18	12	1.1947 ± 0.1511	0.947	0.30669	96.1483	-0.02442 ± 0.00818	0.01315 ± 0.00763	0.12497 ± 0.06103	1.01335 ± 0.13872
BRIGHT	01/07/97	06	6	2.1875 ± 0.2917	0.9656	0.15628	103.44	-0.24924 ± 0.0835	-0.01867 ± 0.01082	0.22557 ± 0.11016	2.02264 ± 0.27689
BRIGHT	01/07/97	12	6	1.9761 ± 0.2787	0.9621	0.19814	102.617	-0.00239 ± 0.0008	0.02303 ± 0.01335	0.18683 ± 0.09124	1.68413 ± 0.23055
BRIGHT	01/07/97	18	12	0.3361 ± 0.1086	0.95963	0.20596	107.482	0.02483 ± 0.00832	0.04074 ± 0.02362	0.04391 ± 0.02144	0.19627 ± 0.02687
BRIGHT	01/08/97	06	6	1.9437 ± 0.2778	0.97186	0.13964	93.4303	0.40811 ± 0.13672	0.00765 ± 0.00444	0.18163 ± 0.0887	1.21391 ± 0.16618
BRIGHT	01/12/97	06	6	0.1316 ± 0.2374	0.8585	0.32911	59.4525	-0.06761 ± 0.02265	0.01296 ± 0.00751	0.04247 ± 0.02074	0.12699 ± 0.01738
BRIGHT	01/12/97	12	6	0.3188 ± 0.2368	0.9147	0.2786	83.8301	-0.07546 ± 0.02528	0.01178 ± 0.00683	0.06533 ± 0.03191	0.17478 ± 0.02393
BRIGHT	01/12/97	18	12	0.9522 ± 0.1346	0.88073	0.6962	91.9326	-0.01382 ± 0.00463	0.00247 ± 0.00143	0.17041 ± 0.08322	0.71662 ± 0.0981

Table C.1A-4 (continued)
Contributions to Elemental Carbon at Core Sites for Individual Samples - NFRAQS Winter 1996/97, Extended Species CMB

Site ID	Date	Start Hour	Duration (hrs)	Meat Cooking	Wood Combustion (Softwood)	Wood Combustion (Hardwood)	Paved Road Dust	Ammonium Sulfate	Ammonium Nitrate	Coal-Fired Powerplant
BRIGHT	12/18/96	06	6	-0.01203 ± 0.00706	0.00791 ± 0.00537	-0.00138 ± 0.00028	0.00617 ± 0.00711	0 ± 0.00011	0 ± 0.00017	0.0011 ± 0.0008
BRIGHT	12/18/96	12	6	-0.00707 ± 0.00415	0.00478 ± 0.00325	-0.00415 ± 0.00083	0.01076 ± 0.01239	0 ± 0.00006	0 ± 0.00006	0.0213 ± 0.01541
BRIGHT	12/18/96	18	12	-99 ± -99	0.02617 ± 0.01777	0.00353 ± 0.0007	0.00367 ± 0.00423	0 ± 0.00013	0 ± 0.00015	-0.00534 ± 0.00386
BRIGHT	12/19/96	06	6	-0.00626 ± 0.00367	0.1663 ± 0.11293	0.00695 ± 0.00139	0.0089 ± 0.01025	0 ± 0.00022	0 ± 0.00039	-0.00703 ± 0.00509
BRIGHT	12/19/96	12	6	-99 ± -99	0.03808 ± 0.02586	0.03994 ± 0.00797	0.0155 ± 0.01784	0 ± 0.00035	0 ± 0.0011	-0.01772 ± 0.01282
BRIGHT	12/19/96	18	12	-99 ± -99	0.01901 ± 0.01291	0.00151 ± 0.0003	0.00333 ± 0.00384	0 ± 0.00007	0 ± 0.00016	-0.00664 ± 0.0048
BRIGHT	12/20/96	06	6	-99 ± -99	0.00381 ± 0.00259	-0.00109 ± 0.00022	0.00466 ± 0.00536	0 ± 0.00003	0 ± 0.0001	0.00413 ± 0.00299
BRIGHT	12/25/96	06	6	-0.00315 ± 0.00185	0.02485 ± 0.01687	-0.00025 ± 0.00005	0.00488 ± 0.00562	0 ± 0.00001	0 ± 0.00003	0.00401 ± 0.0029
BRIGHT	12/25/96	12	6	-0.00485 ± 0.00285	0.0055 ± 0.00373	-0.00096 ± 0.00019	0.00545 ± 0.00628	0 ± 0.00004	0 ± 0.00012	0.0077 ± 0.00557
BRIGHT	12/25/96	18	12	-99 ± -99	0.00382 ± 0.00259	0.00396 ± 0.00079	0.00304 ± 0.0035	0 ± 0.00027	0 ± 0.00064	-0.00249 ± 0.0018
BRIGHT	12/26/96	06	6	-99 ± -99	0.01233 ± 0.00837	-0.0029 ± 0.00058	0.01058 ± 0.01218	0 ± 0.00032	0 ± 0.00066	0.00561 ± 0.00406
BRIGHT	12/26/96	12	6	0.01414 ± 0.00829	0.01186 ± 0.00805	0.01188 ± 0.00237	0.01371 ± 0.01578	0 ± 0.00028	0 ± 0.00063	0.00659 ± 0.00477
BRIGHT	12/26/96	18	12	-99 ± -99	0.00647 ± 0.00439	0.00124 ± 0.00025	0.00782 ± 0.009	0 ± 0.00016	0 ± 0.00036	0.00635 ± 0.00459
BRIGHT	12/30/96	06	6	0.0152 ± 0.00891	0.00131 ± 0.00089	0.02718 ± 0.00542	0.00901 ± 0.01037	0 ± 0.00004	0 ± 0.00004	0.01362 ± 0.00985
BRIGHT	12/30/96	12	6	-0.00645 ± 0.00378	-0.01785 ± 0.01212	0.02124 ± 0.00424	0.01244 ± 0.01433	0 ± 0.00005	0 ± 0.00002	0.00696 ± 0.00504
BRIGHT	12/30/96	18	12	-0.00265 ± 0.00156	0.04036 ± 0.02741	0.02538 ± 0.00506	0.00713 ± 0.00821	0 ± 0.00006	0 ± 0.00005	0.0039 ± 0.00282
BRIGHT	12/31/96	06	6	-0.0088 ± 0.00516	0.00431 ± 0.00293	-0.00107 ± 0.00021	0.01744 ± 0.02008	0 ± 0.00008	0 ± 0.00025	0.00627 ± 0.00454
BRIGHT	12/31/96	12	6	-99 ± -99	-0.00072 ± 0.00049	-0.00059 ± 0.00012	0.01431 ± 0.01647	0 ± 0.00008	0 ± 0.0003	0.01849 ± 0.01337
BRIGHT	12/31/96	18	12	-99 ± -99	0.01981 ± 0.01345	0.00083 ± 0.00017	0.01002 ± 0.01154	0 ± 0.00003	0 ± 0.00003	0.00616 ± 0.00445
BRIGHT	01/01/97	06	6	-99 ± -99	-99 ± -99	0.0092 ± 0.00183	0.00895 ± 0.0103	0 ± 0.00004	0 ± 0.00014	-0.00332 ± 0.0024
BRIGHT	01/01/97	12	6	-99 ± -99	-0.01568 ± 0.01065	0.00222 ± 0.00044	0.02715 ± 0.03127	0 ± 0.00013	0 ± 0.00068	-0.00978 ± 0.00708
BRIGHT	01/01/97	18	12	-0.00571 ± 0.00335	-0.0058 ± 0.00394	0.00032 ± 0.00006	0.01211 ± 0.01395	0 ± 0.00005	0 ± 0.00009	0.00293 ± 0.00212
BRIGHT	01/02/97	06	6	-0.00458 ± 0.00269	-0.00729 ± 0.00495	0.00886 ± 0.00177	0.01991 ± 0.02293	0 ± 0.00003	0 ± 0.00002	0.01412 ± 0.01021
BRIGHT	01/02/97	12	6	-99 ± -99	-0.00954 ± 0.00648	-0.00012 ± 0.00002	0.02353 ± 0.02709	0 ± 0.00004	0 ± 0.00005	0.00195 ± 0.00141
BRIGHT	01/02/97	18	12	-0.00637 ± 0.00373	0.00201 ± 0.00137	0.00012 ± 0.00002	0.01347 ± 0.01551	0 ± 0.00005	0 ± 0.00011	0.00188 ± 0.00136
BRIGHT	01/06/97	06	6	-99 ± -99	0.11675 ± 0.07928	0.01271 ± 0.00254	0.00199 ± 0.00229	0 ± 0.00003	0 ± 0.00022	0.00168 ± 0.00122
BRIGHT	01/06/97	12	6	-0.00559 ± 0.00328	0.00102 ± 0.00069	-0.00038 ± 0.00007	0.00199 ± 0.00229	0 ± 0.00007	0 ± 0.00036	-0.00005 ± 0.00004
BRIGHT	01/06/97	18	12	-0.00601 ± 0.00353	-0.00078 ± 0.00053	0.00458 ± 0.00091	0.0036 ± 0.00415	0 ± 0.00011	0 ± 0.00027	-0.00202 ± 0.00146
BRIGHT	01/07/97	06	6	-99 ± -99	0.00529 ± 0.00359	-0.00146 ± 0.00029	0.01171 ± 0.01348	0 ± 0.0001	0 ± 0.0004	0.00107 ± 0.00077
BRIGHT	01/07/97	12	6	-0.01142 ± 0.0067	-0.0163 ± 0.01107	0.00243 ± 0.00048	0.02309 ± 0.02659	0 ± 0.00012	0 ± 0.00073	0.01113 ± 0.00805
BRIGHT	01/07/97	18	12	-99 ± -99	-0.00164 ± 0.00111	0.00398 ± 0.00079	0.00969 ± 0.01116	0 ± 0.00008	0 ± 0.0002	-0.00008 ± 0.00006
BRIGHT	01/08/97	06	6	-99 ± -99	0.00451 ± 0.00306	-0.00072 ± 0.00014	0.00565 ± 0.00651	0 ± 0.0002	0 ± 0.00079	0.00543 ± 0.00393
BRIGHT	01/12/97	06	6	-0.00481 ± 0.00282	0.00933 ± 0.00634	0.0022 ± 0.00044	0.0019 ± 0.00219	0 ± 0.00008	0 ± 0.00003	-0.00176 ± 0.00127
BRIGHT	01/12/97	12	6	-99 ± -99	0.01554 ± 0.01055	-0.00022 ± 0.00004	0.00375 ± 0.00431	0 ± 0.00009	0 ± 0.00009	0.00321 ± 0.00232
BRIGHT	01/12/97	18	12	-99 ± -99	-0.00277 ± 0.00188	0.01009 ± 0.00201	0.01568 ± 0.01805	0 ± 0.00016	0 ± 0.00041	0.00621 ± 0.00449

Table C.1A-4 (continued)
Contributions to Elemental Carbon at Core Sites for Individual Samples - NFRAQS Winter 1996/97, Extended Species CMB

Site ID	Date	Start Hour	Duration (hrs)	Elemental Carbon (µg/m^3)	R-square	Chi-square	Percent of Mass	Incremental cold start ("puffers")	Hot stabilized, non-smoking	Smoking LDGV exhaust	Diesel Exhaust
BRIGHT	01/13/97	06	6	1.1642 ± 0.2323	0.96715	0.16167	104.478	-0.1375 ± 0.04606	-0.00037 ± 0.00021	0.24724 ± 0.12075	0.94256 ± 0.12903
BRIGHT	01/13/97	12	6	1.0445 ± 0.2341	0.96866	0.1359	83.0781	-0.26223 ± 0.08785	-0.01228 ± 0.00712	0.28284 ± 0.13813	0.95411 ± 0.13061
BRIGHT	01/13/97	18	12	1.768 ± 0.1949	0.95778	0.25771	90.2663	0.01866 ± 0.00625	0.02047 ± 0.01187	0.26807 ± 0.13092	1.36954 ± 0.18748
BRIGHT	01/14/97	06	6	2.2766 ± 0.2954	0.95196	0.28788	91.2966	0.38464 ± 0.12885	-0.01304 ± 0.00756	0.39398 ± 0.19241	1.3845 ± 0.18953
BRIGHT	01/14/97	12	6	0.7836 ± 0.2209	0.96109	0.19749	69.8811	-0.12509 ± 0.04191	0.05923 ± 0.03434	0.21356 ± 0.10429	0.57213 ± 0.07832
BRIGHT	01/14/97	18	12	1.6455 ± 0.1848	0.95692	0.28384	97.1516	0.19959 ± 0.06686	0.04152 ± 0.02407	0.24376 ± 0.11905	1.07213 ± 0.14677
BRIGHT	01/15/97	06	6	0.6841 ± 0.215	0.95308	0.22366	62.4223	-0.16913 ± 0.05666	0.04831 ± 0.02801	0.16075 ± 0.07851	0.57629 ± 0.07889
BRIGHT	01/15/97	12	6	0.4741 ± 0.2647	0.94333	0.28034	116.239	0.01171 ± 0.00392	0.03067 ± 0.01778	0.06818 ± 0.0333	0.3042 ± 0.04164
BRIGHT	01/15/97	18	12	0.2066 ± 0.1254	0.96899	0.13518	98.3563	-0.14549 ± 0.04874	0.02262 ± 0.01312	0.08307 ± 0.04057	0.20567 ± 0.02815
BRIGHT	01/16/97	06	6	0.9796 ± 0.2281	0.95821	0.20078	91.6799	-0.12782 ± 0.04282	0.02592 ± 0.01503	0.12854 ± 0.06277	0.83296 ± 0.11403
BRIGHT	01/16/97	12	6	0.596 ± 0.2211	0.96945	0.13287	92.5676	-0.20563 ± 0.06888	-0.00133 ± 0.00077	0.17603 ± 0.08597	0.5468 ± 0.07485
BRIGHT	01/16/97	18	12	1.7195 ± 0.1866	0.91445	0.58308	89.7666	0.05506 ± 0.01844	-0.00762 ± 0.00442	0.20253 ± 0.09891	1.29098 ± 0.17673
BRIGHT	01/17/97	06	6	3.5557 ± 0.3915	0.93106	0.44455	95.7647	0.35016 ± 0.1173	0.04006 ± 0.02323	0.38959 ± 0.19026	2.57015 ± 0.35184
BRIGHT	01/17/97	12	6	2.4223 ± 0.3063	0.95877	0.23938	97.3321	0.57524 ± 0.1927	0.04764 ± 0.02763	0.11019 ± 0.05381	1.5485 ± 0.21198
BRIGHT	01/17/97	18	12	2.7736 ± 0.2761	0.93145	0.40475	88.3774	0.37654 ± 0.12614	0.00609 ± 0.00353	0.20328 ± 0.09928	2.03171 ± 0.27813
BRIGHT	01/18/97	06	6	1.9007 ± 0.2776	0.92153	0.37625	141.516	0.35177 ± 0.11784	0.06409 ± 0.03716	0.1726 ± 0.08429	1.10009 ± 0.1506
BRIGHT	01/18/97	12	6	1.4381 ± 0.2479	0.94237	0.24048	113.987	0.4892 ± 0.16388	0.00809 ± 0.00469	0.09782 ± 0.04777	0.68417 ± 0.09366
BRIGHT	01/18/97	18	12	1.227 ± 0.1585	0.92797	0.40816	101.699	0.14847 ± 0.04974	0.00353 ± 0.00205	0.13716 ± 0.06699	0.78367 ± 0.10728
BRIGHT	01/19/97	06	6	0.9463 ± 0.2295	0.93331	0.25646	157.052	-0.16245 ± 0.05442	0.02406 ± 0.01395	0.16128 ± 0.07877	0.76458 ± 0.10467
BRIGHT	01/19/97	12	6	0.7353 ± 0.2249	0.86155	0.43767	104.965	-0.07637 ± 0.02558	0.00272 ± 0.00158	0.22726 ± 0.11099	0.49051 ± 0.06715
BRIGHT	01/19/97	18	12	1.7857 ± 0.1969	0.96338	0.21055	90.0162	0.53124 ± 0.17796	0.03749 ± 0.02174	0.19073 ± 0.09315	0.96107 ± 0.13157
BRIGHT	01/20/97	06	6	2.3345 ± 0.3016	0.904	0.4892	93.451	0.03805 ± 0.01275	0.1009 ± 0.05851	0.23668 ± 0.11559	1.70114 ± 0.23288
BRIGHT	01/20/97	12	6	2.5104 ± 0.3186	0.90779	0.43139	128.735	-0.07533 ± 0.02524	0.03998 ± 0.02318	0.16681 ± 0.08147	2.10139 ± 0.28767
BRIGHT	01/27/97	06	6	0.3787 ± 0.248	0.96685	0.13429	89.2059	-0.0509 ± 0.01705	-0.01129 ± 0.00655	0.07266 ± 0.03549	0.31651 ± 0.04333
BRIGHT	01/27/97	12	6	0.2951 ± 0.235	0.92615	0.27244	94.4204	0.13068 ± 0.04378	-0.00548 ± 0.00318	-0.0073 ± 0.00356	0.14895 ± 0.02039
BRIGHT	01/27/97	18	12	1.3806 ± 0.1656	0.93919	0.35318	99.0156	0.35042 ± 0.11739	-0.00113 ± 0.00065	0.12382 ± 0.06047	0.8295 ± 0.11355
BRIGHT	01/28/97	12	6	2.249 ± 0.2935	0.94523	0.28944	76.6791	0.73147 ± 0.24504	-0.02647 ± 0.01535	0.1669 ± 0.08151	1.23927 ± 0.16965
BRIGHT	01/28/97	18	12	0.3413 ± 0.1095	0.91035	0.48349	86.72	0.06305 ± 0.02112	0.03375 ± 0.01957	0.03282 ± 0.01603	0.18881 ± 0.02585
BRIGHT	01/29/97	06	6	0.5101 ± 0.2775	0.95747	0.19574	102.231	0.81584 ± 0.27331	-0.03374 ± 0.01957	0.02841 ± 0.01388	-0.3139 ± 0.04297
BRIGHT	01/29/97	12	6	0.4685 ± 0.2667	0.92903	0.33933	114.113	0.30217 ± 0.10123	0.03227 ± 0.01871	0.01418 ± 0.00692	0.1458 ± 0.01996
BRIGHT	01/29/97	18	12	0.8119 ± 0.1282	0.95258	0.23933	104.998	-0.02022 ± 0.00677	0.0022 ± 0.00127	0.09012 ± 0.04401	0.65575 ± 0.08977
BRIGHT	01/30/97	06	6	1.7163 ± 0.2631	0.90171	0.48854	124.391	0.16983 ± 0.05689	0.02478 ± 0.01437	0.24438 ± 0.11935	1.18269 ± 0.1619
BRIGHT	01/30/97	12	6	0.531 ± 0.3026	0.87866	0.24076	125.023	-0.08233 ± 0.02758	0.03202 ± 0.01857	0.11903 ± 0.05813	0.28548 ± 0.03908
BRIGHT	01/30/97	18	12	0.582 ± 0.1179	0.89778	0.33437	155.019	-0.00424 ± 0.00142	0.01723 ± 0.00999	0.07164 ± 0.03499	0.41584 ± 0.05693

Table C.1A-4 (continued)
Contributions to Elemental Carbon at Core Sites for Individual Samples - NFRAQS Winter 1996/97, Extended Species CMB

Site ID	Date	Start Hour	Duration (hrs)	Meat Cooking	Wood Combustion (Softwood)	Wood Combustion (Hardwood)	Paved Road Dust	Ammonium Sulfate	Ammonium Nitrate	Coal-Fired Powerplant
BRIGHT	01/13/97	06	6	-99 ± -99	-0.0083 ± 0.00564	0.00458 ± 0.00091	0.00716 ± 0.00825	0 ± 0.00022	0 ± 0.00061	0.01342 ± 0.00971
BRIGHT	01/13/97	12	6	-99 ± -99	-0.00009 ± 0.00006	0.00601 ± 0.0012	0.01114 ± 0.01283	0 ± 0.00035	0 ± 0.00084	-0.00466 ± 0.00337
BRIGHT	01/13/97	18	12	-99 ± -99	0.00523 ± 0.00355	0.01479 ± 0.00295	0.00967 ± 0.01113	0 ± 0.00032	0 ± 0.00104	-0.00606 ± 0.00438
BRIGHT	01/14/97	06	6	-0.00512 ± 0.003	0.02171 ± 0.01474	0.04795 ± 0.00956	0.01289 ± 0.01485	0 ± 0.0005	0 ± 0.0012	0.0004 ± 0.00029
BRIGHT	01/14/97	12	6	-0.00386 ± 0.00227	0.02762 ± 0.01875	-0.0022 ± 0.00044	0.00335 ± 0.00386	0 ± 0.00032	0 ± 0.00047	-0.00695 ± 0.00503
BRIGHT	01/14/97	18	12	-0.00794 ± 0.00466	0.038 ± 0.02581	0.00724 ± 0.00144	0.00512 ± 0.00589	0 ± 0.00047	0 ± 0.00053	-0.01354 ± 0.0098
BRIGHT	01/15/97	06	6	-0.00663 ± 0.00389	0.00751 ± 0.0051	0.00395 ± 0.00079	0.01145 ± 0.01318	0 ± 0.00019	0 ± 0.00017	0.00595 ± 0.0043
BRIGHT	01/15/97	12	6	0.00676 ± 0.00397	0.01243 ± 0.00844	-0.00009 ± 0.00002	0.00332 ± 0.00382	0 ± 0.00016	0 ± 0.00022	0.00271 ± 0.00196
BRIGHT	01/15/97	18	12	-0.00151 ± 0.00089	0.00586 ± 0.00398	-0.0006 ± 0.00012	0.00389 ± 0.00448	0 ± 0.00018	0 ± 0.00013	0.00671 ± 0.00485
BRIGHT	01/16/97	06	6	-99 ± -99	0.00326 ± 0.00221	0.00065 ± 0.00013	0.00468 ± 0.00539	0 ± 0.00016	0 ± 0.00023	0.01872 ± 0.01354
BRIGHT	01/16/97	12	6	-0.00296 ± 0.00174	0.01663 ± 0.0113	0.00256 ± 0.00051	0.00805 ± 0.00927	0 ± 0.0002	0 ± 0.00022	0.00006 ± 0.00004
BRIGHT	01/16/97	18	12	-99 ± -99	0.06218 ± 0.04223	0.01082 ± 0.00216	0.0128 ± 0.01474	0 ± 0.00027	0 ± 0.00059	0.01126 ± 0.00815
BRIGHT	01/17/97	06	6	-99 ± -99	0.02683 ± 0.01822	0.0284 ± 0.00566	0.01752 ± 0.02018	0 ± 0.00053	0 ± 0.00115	-0.00299 ± 0.00216
BRIGHT	01/17/97	12	6	0.03608 ± 0.02116	0.11765 ± 0.07989	0.01365 ± 0.00272	0.00965 ± 0.01112	0 ± 0.0004	0 ± 0.00168	-0.00386 ± 0.00279
BRIGHT	01/17/97	18	12	-99 ± -99	0.00067 ± 0.00046	0.01334 ± 0.00266	0.02026 ± 0.02333	0 ± 0.00026	0 ± 0.00088	-0.01713 ± 0.01239
BRIGHT	01/18/97	06	6	-99 ± -99	0.01766 ± 0.01199	0.00953 ± 0.0019	0.00593 ± 0.00683	0 ± 0.00004	0 ± 0.00017	-0.00321 ± 0.00232
BRIGHT	01/18/97	12	6	-99 ± -99	-0.00145 ± 0.00099	0.00685 ± 0.00137	0.00444 ± 0.00511	0 ± 0.00004	0 ± 0.00034	0.00488 ± 0.00353
BRIGHT	01/18/97	18	12	-99 ± -99	0.05631 ± 0.03824	0.00958 ± 0.00191	0.00476 ± 0.00548	0 ± 0.00005	0 ± 0.00038	-0.00552 ± 0.00399
BRIGHT	01/19/97	06	6	-99 ± -99	0.01027 ± 0.00698	0.00293 ± 0.00058	0.0022 ± 0.00253	0 ± 0.00004	0 ± 0.0003	0.01066 ± 0.00771
BRIGHT	01/19/97	12	6	-0.00592 ± 0.00347	-0.00155 ± 0.00105	-0.00181 ± 0.00036	0.01027 ± 0.01183	0 ± 0.00002	0 ± 0.00011	0.00557 ± 0.00403
BRIGHT	01/19/97	18	12	-0.00166 ± 0.00097	0.00124 ± 0.00084	0.02041 ± 0.00407	0.00547 ± 0.0063	0 ± 0.00016	0 ± 0.00118	-0.00866 ± 0.00626
BRIGHT	01/20/97	06	6	-99 ± -99	0.00408 ± 0.00277	0.01406 ± 0.0028	0.02405 ± 0.02769	0 ± 0.00004	0 ± 0.00015	0.01808 ± 0.01308
BRIGHT	01/20/97	12	6	-99 ± -99	0.01025 ± 0.00696	0.00793 ± 0.00158	0.00675 ± 0.00778	0 ± 0.00003	0 ± 0.00038	0.01967 ± 0.01423
BRIGHT	01/27/97	06	6	0.00239 ± 0.0014	0.00606 ± 0.00412	0.00163 ± 0.00033	0.00312 ± 0.0036	0 ± 0.00018	0 ± 0.00036	-0.00498 ± 0.0036
BRIGHT	01/27/97	12	6	0.01711 ± 0.01004	0.0001 ± 0.00007	0.00153 ± 0.0003	0.00116 ± 0.00134	0 ± 0.00011	0 ± 0.00013	0.00394 ± 0.00285
BRIGHT	01/27/97	18	12	-99 ± -99	0.00204 ± 0.00139	0.00913 ± 0.00182	0.00826 ± 0.00952	0 ± 0.00016	0 ± 0.00045	-0.00993 ± 0.00719
BRIGHT	01/28/97	12	6	-99 ± -99	0.00466 ± 0.00317	0.02216 ± 0.00442	0.01522 ± 0.01752	0 ± 0.00026	0 ± 0.00106	-0.00704 ± 0.00509
BRIGHT	01/28/97	18	12	0.0059 ± 0.00346	-0.00877 ± 0.00596	0.00385 ± 0.00077	0.00131 ± 0.0015	0 ± 0.00008	0 ± 0.00021	0.00078 ± 0.00056
BRIGHT	01/29/97	06	6	0.03512 ± 0.0206	-0.00371 ± 0.00252	-0.00054 ± 0.00011	0.00651 ± 0.00749	0 ± 0.00014	0 ± 0.00032	0.00943 ± 0.00682
BRIGHT	01/29/97	12	6	0.02476 ± 0.01452	0.00742 ± 0.00504	-0.0024 ± 0.00048	0.00163 ± 0.00187	0 ± 0.00015	0 ± 0.00019	-0.00204 ± 0.00147
BRIGHT	01/29/97	18	12	-99 ± -99	-0.00106 ± 0.00072	-0.00081 ± 0.00016	0.00181 ± 0.00209	0 ± 0.00009	0 ± 0.00009	0.00424 ± 0.00307
BRIGHT	01/30/97	06	6	0.00297 ± 0.00174	0.00306 ± 0.00208	-0.00002 ± 0	0.01199 ± 0.01381	0 ± 0.00003	0 ± 0.00014	0.02309 ± 0.0167
BRIGHT	01/30/97	12	6	-99 ± -99	-0.00197 ± 0.00134	-0.00065 ± 0.00013	0.00549 ± 0.00633	0 ± 0.00001	0 ± 0.00005	0.01267 ± 0.00917
BRIGHT	01/30/97	18	12	-99 ± -99	-0.0024 ± 0.00163	-0.00016 ± 0.00003	0.0026 ± 0.00299	0 ± 0.00002	0 ± 0.00002	0.00592 ± 0.00428

Table C.1A-4 (continued)
Contributions to Elemental Carbon at Core Sites for Individual Samples - NFRAQS Winter 1996/97, Extended Species CMB

Site ID	Date	Start Hour	Duration (hrs)	Elemental Carbon (µg/m^3)	R-square	Chi-square	Percent of Mass	Incremental cold start ("puffers")	Hot stabilized, non-smoking	Smoking LDGV exhaust	Diesel Exhaust
WELBY	12/18/96	12	6	0.71 ± 0.2077	0.90377	0.4508	107.705	-0.03554 ± 0.01191	0.11302 ± 0.06554	0.09714 ± 0.04744	0.53354 ± 0.07304
WELBY	12/19/96	06	6	3.0863 ± 0.3523	0.927	0.49731	112.131	0.24161 ± 0.08094	0.31914 ± 0.18505	0.30432 ± 0.14862	1.93149 ± 0.26441
WELBY	12/19/96	12	6	3.491 ± 0.3807	0.93103	0.42077	94.2949	0.66031 ± 0.2212	0.24012 ± 0.13923	0.27016 ± 0.13194	2.19327 ± 0.30025
WELBY	12/19/96	18	12	2.4503 ± 0.2472	0.87751	0.8296	98.3231	1.06354 ± 0.35628	0.28073 ± 0.16278	-0.04832 ± 0.0236	1.28416 ± 0.1758
WELBY	12/20/96	06	6	4.9771 ± 0.5022	0.89281	0.57922	107.337	2.42626 ± 0.81279	0.39499 ± 0.22903	-0.07379 ± 0.03604	1.80609 ± 0.24725
WELBY	12/25/96	06	6	1.0046 ± 0.2202	0.93949	0.28542	105.787	0.00802 ± 0.00269	0.04889 ± 0.02835	0.14527 ± 0.07095	0.76934 ± 0.10532
WELBY	12/25/96	12	6	0.2521 ± 0.2228	0.86983	0.39052	123.483	-0.04692 ± 0.01572	0.04749 ± 0.02754	0.131 ± 0.06397	0.20851 ± 0.02854
WELBY	12/25/96	18	12	0.3258 ± 0.106	0.96283	0.1544	91.588	-0.07429 ± 0.02489	0.00465 ± 0.0027	0.05432 ± 0.02653	0.30912 ± 0.04232
WELBY	12/30/96	06	6	2.1413 ± 0.282	0.82721	0.7915	135.081	0.60972 ± 0.20426	0.26813 ± 0.15547	0.0547 ± 0.02671	1.07299 ± 0.14689
WELBY	12/30/96	12	6	3.9305 ± 0.4146	0.89613	0.48401	115.822	1.01877 ± 0.34128	0.13192 ± 0.07649	0.09038 ± 0.04414	2.44061 ± 0.33411
WELBY	12/30/96	18	12	3.4382 ± 0.3326	0.93275	0.40653	102.551	0.99474 ± 0.33324	0.07092 ± 0.04112	0.18537 ± 0.09053	1.91589 ± 0.26228
WELBY	12/31/96	06	6	4.3245 ± 0.4489	0.92342	0.38811	103.39	-0.16701 ± 0.05595	0.02876 ± 0.01668	0.25294 ± 0.12353	3.81697 ± 0.52253
WELBY	12/31/96	12	6	2.2596 ± 0.2848	0.86193	0.65173	122.643	1.05663 ± 0.35397	0.1025 ± 0.05943	0.12357 ± 0.06035	0.87425 ± 0.11968
WELBY	12/31/96	18	12	3.4514 ± 0.3332	0.84326	0.98928	102.979	1.53764 ± 0.51511	0.04006 ± 0.02323	-99 ± -99	1.48783 ± 0.20368
WELBY	01/01/97	06	6	1.3032 ± 0.2305	0.80837	0.87535	116.785	1.64353 ± 0.55058	0.25661 ± 0.14879	-99 ± -99	-0.52576 ± 0.07197
WELBY	01/01/97	12	6	2.3939 ± 0.2959	0.91336	0.48448	110.43	1.51757 ± 0.50838	0.27385 ± 0.15879	0.01841 ± 0.00899	0.60936 ± 0.08342
WELBY	01/01/97	18	12	2.8122 ± 0.2771	0.86078	1.07183	111.064	-99 ± -99	0.32398 ± 0.18786	0.02118 ± 0.01034	1.60477 ± 0.21969
WELBY	01/02/97	06	6	7.8539 ± 0.7499	0.94831	0.30692	109.491	2.54894 ± 0.85389	0.34908 ± 0.20241	-99 ± -99	4.33155 ± 0.59297
WELBY	01/02/97	12	6	2.531 ± 0.3047	0.91639	0.45934	111.9	0.28826 ± 0.09657	0.17019 ± 0.09868	0.12674 ± 0.0619	1.78759 ± 0.24471
WELBY	01/02/97	18	12	3.1267 ± 0.3046	0.92603	0.43418	103.929	1.30528 ± 0.43727	0.2251 ± 0.13052	-99 ± -99	1.66784 ± 0.22832
WELBY	01/06/97	06	6	0.8118 ± 0.2063	0.9035	0.44255	97.7999	0.41331 ± 0.13846	0.0315 ± 0.01827	-99 ± -99	0.1582 ± 0.02166
WELBY	01/06/97	12	6	1.1191 ± 0.2242	0.93675	0.30957	83.4631	0.71329 ± 0.23895	0.04881 ± 0.0283	-0.08334 ± 0.0407	0.29785 ± 0.04077
WELBY	01/06/97	18	12	2.0072 ± 0.209	0.91765	0.56058	98.0311	0.00488 ± 0.00163	0.01744 ± 0.01012	0.16299 ± 0.0796	1.69734 ± 0.23236
WELBY	01/07/97	06	6	4.0979 ± 0.427	0.89877	0.59799	94.7872	2.05052 ± 0.68692	0.31814 ± 0.18447	0.11578 ± 0.05654	1.48836 ± 0.20375
WELBY	01/07/97	12	6	2.0253 ± 0.2737	0.90564	0.53508	98.332	0.20216 ± 0.06772	0.0701 ± 0.04065	0.16606 ± 0.0811	1.47891 ± 0.20246
WELBY	01/07/97	18	12	1.1945 ± 0.1481	0.95372	0.26338	84.4171	0.85324 ± 0.28583	0.19773 ± 0.11465	0.04865 ± 0.02376	0.05551 ± 0.0076
WELBY	01/08/97	06	6	4.166 ± 0.4347	0.92051	0.48359	129.5	2.10408 ± 0.70486	0.24113 ± 0.13982	0.09424 ± 0.04602	2.04701 ± 0.28023
WELBY	01/12/97	06	6	0.5062 ± 0.3005	0.89251	0.43755	103.997	0.51614 ± 0.1729	0.19204 ± 0.11135	-99 ± -99	0.07914 ± 0.01083
WELBY	01/12/97	12	6	0.3847 ± 0.2362	0.90861	0.41414	89.8276	0.44882 ± 0.15035	0.08828 ± 0.05119	-0.00228 ± 0.00111	-0.0613 ± 0.00839
WELBY	01/12/97	18	12	1.2331 ± 0.1485	0.89666	0.68482	99.207	0.50802 ± 0.17019	0.04241 ± 0.02459	0.15539 ± 0.07589	0.49729 ± 0.06808
WELBY	01/13/97	06	6	0.9352 ± 0.2096	0.96316	0.19794	94.5547	0.16476 ± 0.05519	0.05826 ± 0.03378	0.27569 ± 0.13464	0.51285 ± 0.07021
WELBY	01/13/97	12	6	1.5599 ± 0.245	0.97159	0.14584	88.7075	-0.22182 ± 0.07431	-0.00979 ± 0.00568	0.22614 ± 0.11044	1.43102 ± 0.1959
WELBY	01/13/97	18	12	1.6124 ± 0.1778	0.96819	0.19145	90.2272	0.3733 ± 0.12506	0.03238 ± 0.01877	0.26165 ± 0.12778	0.80694 ± 0.11047
WELBY	01/14/97	12	6	2.4555 ± 0.2994	0.97175	0.18661	96.2249	0.52035 ± 0.17432	0.07593 ± 0.04403	0.30739 ± 0.15012	1.4848 ± 0.20326
WELBY	01/14/97	18	12	2.2337 ± 0.229	0.92315	0.47248	100.198	0.472 ± 0.15812	0.04177 ± 0.02422	0.12172 ± 0.05944	0.74963 ± 0.10262

Table C.1A-4 (continued)
Contributions to Elemental Carbon at Core Sites for Individual Samples - NFRAQS Winter 1996/97, Extended Species CMB

Site ID	Date	Start Hour	Duration (hrs)	Meat Cooking	Wood Combustion (Softwood)	Wood Combustion (Hardwood)	Paved Road Dust	Ammonium Sulfate	Ammonium Nitrate	Coal-Fired Powerplant
WELBY	12/18/96	12	6	0.00144 ± 0.00084	0.03672 ± 0.02494	0.00127 ± 0.00025	0.00408 ± 0.0047	0 ± 0.00006	0 ± 0.00012	0.0094 ± 0.0068
WELBY	12/19/96	06	6	-99 ± -99	0.17304 ± 0.11751	0.0141 ± 0.00281	0.02156 ± 0.02483	0 ± 0.00022	0 ± 0.00043	0.00615 ± 0.00445
WELBY	12/19/96	12	6	-99 ± -99	0.01802 ± 0.01224	0.00235 ± 0.00047	0.01966 ± 0.02264	0 ± 0.00032	0 ± 0.00099	-0.02468 ± 0.01785
WELBY	12/19/96	18	12	0.04711 ± 0.02763	0.0124 ± 0.00842	0.01582 ± 0.00315	0.01176 ± 0.01354	0 ± 0.00017	0 ± 0.00029	-0.01076 ± 0.00778
WELBY	12/20/96	06	6	0.00927 ± 0.00544	0.0552 ± 0.03748	0.1276 ± 0.02545	0.03202 ± 0.03687	0 ± 0.00012	0 ± 0.00024	-0.01238 ± 0.00896
WELBY	12/25/96	06	6	-0.00232 ± 0.00136	0.01995 ± 0.01355	-0.00117 ± 0.00023	0.00602 ± 0.00693	0 ± 0.00005	0 ± 0.00014	0.01284 ± 0.00929
WELBY	12/25/96	12	6	-99 ± -99	0.02884 ± 0.01959	-0.00659 ± 0.00132	0.00816 ± 0.00939	0 ± 0.00003	0 ± 0.00006	0.0048 ± 0.00347
WELBY	12/25/96	18	12	-99 ± -99	0.02424 ± 0.01646	-0.002 ± 0.0004	0.0049 ± 0.00564	0 ± 0.00023	0 ± 0.00048	-0.00198 ± 0.00143
WELBY	12/30/96	06	6	0.00012 ± 0.00007	0.0903 ± 0.06132	0.02554 ± 0.00509	0.01849 ± 0.02129	0 ± 0.00002	0 ± 0.00009	0.01769 ± 0.0128
WELBY	12/30/96	12	6	-99 ± -99	0.00687 ± 0.00467	0.03992 ± 0.00796	0.03829 ± 0.04409	0 ± 0.00006	0 ± 0.0001	0.02249 ± 0.01627
WELBY	12/30/96	18	12	-99 ± -99	0.10818 ± 0.07347	0.0199 ± 0.00397	0.02017 ± 0.02322	0 ± 0.00007	0 ± 0.00014	-0.00293 ± 0.00212
WELBY	12/31/96	06	6	-99 ± -99	0.04342 ± 0.02949	0.01322 ± 0.00264	0.03765 ± 0.04335	0 ± 0.00013	0 ± 0.00042	0.04374 ± 0.03164
WELBY	12/31/96	12	6	-99 ± -99	0.01827 ± 0.01241	0.04176 ± 0.00833	0.02628 ± 0.03026	0 ± 0.00006	0 ± 0.00008	0.01492 ± 0.01079
WELBY	12/31/96	18	12	0.03032 ± 0.01778	0.20428 ± 0.13872	0.21359 ± 0.0426	0.01917 ± 0.02207	0 ± 0.00007	0 ± 0.0001	0.05674 ± 0.04104
WELBY	01/01/97	06	6	-99 ± -99	0.17709 ± 0.12026	0.07108 ± 0.01418	0.0072 ± 0.00829	0 ± 0.00003	0 ± 0.00012	0.02763 ± 0.01999
WELBY	01/01/97	12	6	0.023 ± 0.01349	-0.01948 ± 0.01323	0.05844 ± 0.01166	0.02269 ± 0.02613	0 ± 0.00008	0 ± 0.00056	0.00845 ± 0.00611
WELBY	01/01/97	18	12	-99 ± -99	0.5281 ± 0.35862	0.23798 ± 0.04747	0.01815 ± 0.0209	0 ± 0.00007	0 ± 0.00015	0.00772 ± 0.00558
WELBY	01/02/97	06	6	0.02697 ± 0.01582	0.15095 ± 0.1025	0.08044 ± 0.01604	0.05023 ± 0.05784	0 ± 0.0002	0 ± 0.00029	0.04596 ± 0.03324
WELBY	01/02/97	12	6	0.02263 ± 0.01327	0.02057 ± 0.01397	0.01391 ± 0.00277	0.03717 ± 0.0428	0 ± 0.00008	0 ± 0.0001	0.02939 ± 0.02126
WELBY	01/02/97	18	12	0.03188 ± 0.0187	0.13304 ± 0.09034	0.00989 ± 0.00197	0.01611 ± 0.01855	0 ± 0.00006	0 ± 0.00012	0.01509 ± 0.01091
WELBY	01/06/97	06	6	0.01347 ± 0.0079	0.1852 ± 0.12577	-0.00672 ± 0.00134	0.00374 ± 0.0043	0 ± 0.00008	0 ± 0.00033	-0.00464 ± 0.00336
WELBY	01/06/97	12	6	0.04388 ± 0.02574	0.08565 ± 0.05816	-0.00037 ± 0.00007	0.01944 ± 0.02239	0 ± 0.00017	0 ± 0.00054	-0.02052 ± 0.01485
WELBY	01/06/97	18	12	0.02908 ± 0.01706	0.00498 ± 0.00338	-0.00212 ± 0.00042	0.02422 ± 0.02789	0 ± 0.00012	0 ± 0.00022	0.00179 ± 0.0013
WELBY	01/07/97	06	6	-99 ± -99	0.24409 ± 0.16576	0.04891 ± 0.00976	0.08826 ± 0.10162	0 ± 0.00014	0 ± 0.00032	0.00352 ± 0.00254
WELBY	01/07/97	12	6	-99 ± -99	0.0067 ± 0.00455	0.00531 ± 0.00106	0.06627 ± 0.07631	0 ± 0.0001	0 ± 0.0006	-0.00475 ± 0.00343
WELBY	01/07/97	18	12	0.00152 ± 0.00089	0.01405 ± 0.00954	0.00297 ± 0.00059	0.02515 ± 0.02896	0 ± 0.00008	0 ± 0.00033	-0.00638 ± 0.00462
WELBY	01/08/97	06	6	-99 ± -99	0.01503 ± 0.01021	0.06579 ± 0.01312	0.02445 ± 0.02815	0 ± 0.00018	0 ± 0.00086	-0.00047 ± 0.00034
WELBY	01/12/97	06	6	-99 ± -99	0.04949 ± 0.03361	0.00826 ± 0.00165	0.00277 ± 0.00319	0 ± 0.00007	0 ± 0.0001	-0.00111 ± 0.0008
WELBY	01/12/97	12	6	-99 ± -99	0.05917 ± 0.04018	0.00264 ± 0.00053	0.00303 ± 0.00349	0 ± 0.0001	0 ± 0.00015	-0.01022 ± 0.00739
WELBY	01/12/97	18	12	-99 ± -99	0.02333 ± 0.01584	-0.0001 ± 0.00002	0.00777 ± 0.00894	0 ± 0.00014	0 ± 0.00038	-0.01401 ± 0.01014
WELBY	01/13/97	06	6	-0.0334 ± 0.01959	-0.00392 ± 0.00266	0.00188 ± 0.00038	0.00508 ± 0.00585	0 ± 0.00019	0 ± 0.00049	-0.00741 ± 0.00536
WELBY	01/13/97	12	6	0.02399 ± 0.01407	0.03626 ± 0.02462	0.00183 ± 0.00037	0.00891 ± 0.01026	0 ± 0.00043	0 ± 0.00101	-0.00633 ± 0.00458
WELBY	01/13/97	18	12	-99 ± -99	0.15414 ± 0.10467	0.00018 ± 0.00004	0.00669 ± 0.0077	0 ± 0.00029	0 ± 0.00099	-0.01955 ± 0.01414
WELBY	01/14/97	12	6	-99 ± -99	0.01014 ± 0.00689	0.00422 ± 0.00084	0.00805 ± 0.00927	0 ± 0.00061	0 ± 0.00079	-0.01544 ± 0.01117
WELBY	01/14/97	18	12	-99 ± -99	1.00435 ± 0.68203	0.02212 ± 0.00441	0.00823 ± 0.00948	0 ± 0.00056	0 ± 0.00055	-0.02084 ± 0.01507

Table C.1A-4 (continued)
Contributions to Elemental Carbon at Core Sites for Individual Samples - NFRAQS Winter 1996/97, Extended Species CMB

Site ID	Date	Start Hour	Duration (hrs)	Elemental Carbon (µg/m^3)	R-square	Chi-square	Percent of Mass	Incremental cold start ("puffers")	Hot stabilized, non-smoking	Smoking LDGV exhaust	Diesel Exhaust
WELBY	01/15/97	06	6	1.2832 ± 0.2262	0.94173	0.33316	99.2222	0.17512 ± 0.05866	0.09874 ± 0.05725	0.20548 ± 0.10035	0.82664 ± 0.11316
WELBY	01/15/97	12	6	1.0549 ± 0.2189	0.96084	0.18988	123.885	-0.2075 ± 0.06951	0.06038 ± 0.03501	0.20498 ± 0.10011	0.90629 ± 0.12407
WELBY	01/15/97	18	12	0.5741 ± 0.1124	0.94194	0.35036	112.472	0.58707 ± 0.19667	0.1212 ± 0.07028	0.03406 ± 0.01663	-0.16788 ± 0.02298
WELBY	01/16/97	06	6	1.2324 ± 0.227	0.96029	0.21541	102.041	-0.09307 ± 0.03118	0.02302 ± 0.01335	0.25037 ± 0.12228	1.01456 ± 0.13889
WELBY	01/16/97	12	6	0.8104 ± 0.2065	0.95238	0.23834	100.645	-0.26839 ± 0.08991	0.0213 ± 0.01235	0.24306 ± 0.1187	0.73837 ± 0.10108
WELBY	01/16/97	18	12	3.4412 ± 0.3314	0.9608	0.23393	95.0494	-0.24034 ± 0.08051	0.0107 ± 0.0062	0.44885 ± 0.21921	3.03049 ± 0.41486
WELBY	01/17/97	06	6	8.127 ± 0.7746	0.95678	0.31214	92.9989	1.64488 ± 0.55103	0.21078 ± 0.12222	0.49188 ± 0.24022	5.46329 ± 0.7479
WELBY	01/17/97	12	6	2.1061 ± 0.2728	0.97467	0.13371	100.367	0.65666 ± 0.21998	0.1415 ± 0.08205	0.11967 ± 0.05844	1.15584 ± 0.15823
WELBY	01/17/97	18	12	3.4296 ± 0.3312	0.92174	0.41368	90.7253	-0.44829 ± 0.15018	-0.04203 ± 0.02437	0.45977 ± 0.22454	3.34906 ± 0.45847
WELBY	01/18/97	06	6	3.0524 ± 0.3479	0.88225	0.71666	101.6	1.22347 ± 0.40986	0.33124 ± 0.19207	0.10872 ± 0.0531	1.26562 ± 0.17326
WELBY	01/18/97	12	6	3.2293 ± 0.3605	0.92851	0.44392	106.712	0.93567 ± 0.31345	0.24025 ± 0.13931	0.09037 ± 0.04413	1.96302 ± 0.26873
WELBY	01/18/97	18	12	2.6925 ± 0.2661	0.9265	0.40892	87.0254	1.97405 ± 0.6613	0.17863 ± 0.10358	-0.05598 ± 0.02734	0.24134 ± 0.03304
WELBY	01/19/97	06	6	1.7957 ± 0.2587	0.93111	0.398	109.711	0.75731 ± 0.2537	0.09183 ± 0.05325	0.21972 ± 0.1073	0.55322 ± 0.07573
WELBY	01/19/97	12	6	0.8915 ± 0.2096	0.8556	0.75814	161.401	0.24377 ± 0.08166	0.2037 ± 0.11811	0.28419 ± 0.13879	0.30231 ± 0.04138
WELBY	01/19/97	18	12	3.3757 ± 0.3255	0.93462	0.31834	97.0529	2.1615 ± 0.7241	0.15602 ± 0.09047	0.0012 ± 0.00059	0.93337 ± 0.12777
WELBY	01/20/97	06	6	4.5888 ± 0.4712	0.86794	0.62028	96.7564	2.59492 ± 0.86929	0.20769 ± 0.12043	0.0783 ± 0.03824	1.75795 ± 0.24066
WELBY	01/20/97	12	6	2.3765 ± 0.2922	0.91992	0.45569	120.114	0.51923 ± 0.17394	0.14197 ± 0.08232	0.21578 ± 0.10538	1.31605 ± 0.18016
WELBY	01/20/97	18	12	2.3226 ± 0.2371	0.91287	0.44615	145.254	1.71251 ± 0.57369	0.12337 ± 0.07154	-0.00446 ± 0.00218	0.7115 ± 0.0974
WELBY	01/27/97	06	6	1.3841 ± 0.2315	0.92769	0.38307	81.1228	1.80581 ± 0.60494	0.13047 ± 0.07565	0.02526 ± 0.01234	-0.52358 ± 0.07168
WELBY	01/27/97	12	6	0.9833 ± 0.2118	0.9747	0.13531	91.3311	0.09557 ± 0.03201	0.00374 ± 0.00217	0.14098 ± 0.06885	0.68492 ± 0.09376
WELBY	01/27/97	18	12	1.9093 ± 0.202	0.94889	0.30045	98.213	0.58834 ± 0.19709	-0.02906 ± 0.01685	0.14568 ± 0.07114	1.08753 ± 0.14888
WELBY	01/28/97	06	6	2.5908 ± 0.3077	0.91079	0.418	89.1911	0.03669 ± 0.01229	0.01307 ± 0.00758	0.19599 ± 0.09571	2.17158 ± 0.29728
WELBY	01/28/97	12	6	3.3821 ± 0.3684	0.95414	0.23169	78.7171	1.07146 ± 0.35894	0.06722 ± 0.03898	0.13641 ± 0.06662	1.92673 ± 0.26376
WELBY	01/28/97	18	12	1.8481 ± 0.1957	0.97067	0.1569	100.184	1.14588 ± 0.38387	0.03393 ± 0.01967	0.10733 ± 0.05241	0.49396 ± 0.06762
WELBY	01/29/97	06	6	2.1963 ± 0.2802	0.96425	0.21505	94.574	0.40545 ± 0.13583	0.04607 ± 0.02671	0.18154 ± 0.08866	1.48852 ± 0.20377
WELBY	01/29/97	12	6	0.7907 ± 0.2048	0.97446	0.12382	123.225	0.22322 ± 0.07478	-0.01756 ± 0.01018	0.12042 ± 0.05881	0.39963 ± 0.05471
WELBY	01/29/97	18	12	1.5342 ± 0.1744	0.93998	0.36747	87.8062	0.60637 ± 0.20313	0.02295 ± 0.01331	0.08407 ± 0.04106	0.69019 ± 0.09448
WELBY	01/30/97	06	6	5.0707 ± 0.5067	0.78205	0.98648	105.349	2.3818 ± 0.7979	0.21837 ± 0.12662	-0.02821 ± 0.01378	2.26903 ± 0.31062
WELBY	01/30/97	12	6	1.1006 ± 0.2171	0.90064	0.34547	182.476	-0.00315 ± 0.00106	0.11689 ± 0.06778	0.15752 ± 0.07693	0.77212 ± 0.1057
WELBY	01/30/97	18	12	0.3165 ± 0.0995	0.87477	0.46159	169.321	0.01611 ± 0.0054	0.06856 ± 0.03976	0.06579 ± 0.03213	0.15229 ± 0.02085

Table C.1A-4 (continued)
Contributions to Elemental Carbon at Core Sites for Individual Samples - NFRAQS Winter 1996/97, Extended Species CMB

Site ID	Date	Start Hour	Duration (hrs)	Meat Cooking	Wood Combustion (Softwood)	Wood Combustion (Hardwood)	Paved Road Dust	Ammonium Sulfate	Ammonium Nitrate	Coal-Fired Powerplant
WELBY	01/15/97	06	6	-0.0223 ± 0.01308	-0.00185 ± 0.00126	0.00193 ± 0.00038	0.00682 ± 0.00786	0 ± 0.00014	0 ± 0.00013	-0.00086 ± 0.00063
WELBY	01/15/97	12	6	-99 ± -99	0.00657 ± 0.00446	-0.00009 ± 0.00002	0.00427 ± 0.00492	0 ± 0.00013	0 ± 0.00015	0.00337 ± 0.00244
WELBY	01/15/97	18	12	0.00162 ± 0.00095	0.02838 ± 0.01927	0.00616 ± 0.00123	0.00411 ± 0.00473	0 ± 0.00018	0 ± 0.00013	-0.00147 ± 0.00106
WELBY	01/16/97	06	6	-0.02134 ± 0.01252	-0.00161 ± 0.00109	0.00111 ± 0.00022	0.01207 ± 0.0139	0 ± 0.00021	0 ± 0.00023	0.00242 ± 0.00175
WELBY	01/16/97	12	6	-0.00344 ± 0.00202	0.01406 ± 0.00955	-0.00123 ± 0.00025	0.03123 ± 0.03596	0 ± 0.00018	0 ± 0.00024	0.0107 ± 0.00774
WELBY	01/16/97	18	12	-0.00464 ± 0.00272	-0.0097 ± 0.00659	-0.00176 ± 0.00035	0.03957 ± 0.04556	0 ± 0.00033	0 ± 0.00073	-0.00622 ± 0.0045
WELBY	01/17/97	06	6	0.04814 ± 0.02824	0.02878 ± 0.01954	0.09193 ± 0.01834	0.04328 ± 0.04984	0 ± 0.00068	0 ± 0.00137	-0.00111 ± 0.0008
WELBY	01/17/97	12	6	0.01422 ± 0.00834	0.01 ± 0.00679	-0.00346 ± 0.00069	0.01713 ± 0.01973	0 ± 0.00027	0 ± 0.00111	-0.01256 ± 0.00909
WELBY	01/17/97	18	12	-0.01252 ± 0.00734	-0.00631 ± 0.00429	-0.00237 ± 0.00047	0.02882 ± 0.03319	0 ± 0.00023	0 ± 0.00081	-0.01545 ± 0.01117
WELBY	01/18/97	06	6	0.02164 ± 0.01269	0.08766 ± 0.05952	0.00535 ± 0.00107	0.03585 ± 0.04128	0 ± 0.00007	0 ± 0.00036	-0.00246 ± 0.00178
WELBY	01/18/97	12	6	0.03359 ± 0.0197	-0.01663 ± 0.01129	0.05694 ± 0.01136	0.02745 ± 0.03161	0 ± 0.00007	0 ± 0.00064	-0.01058 ± 0.00765
WELBY	01/18/97	18	12	0.04047 ± 0.02374	0.29107 ± 0.19766	0.09775 ± 0.0195	0.00692 ± 0.00796	0 ± 0.00006	0 ± 0.00035	0.0085 ± 0.00615
WELBY	01/19/97	06	6	0.0111 ± 0.00651	0.05253 ± 0.03567	-0.00039 ± 0.00008	0.01407 ± 0.0162	0 ± 0.00006	0 ± 0.00021	0.01571 ± 0.01136
WELBY	01/19/97	12	6	-99 ± -99	-0.00212 ± 0.00144	0.00504 ± 0.00101	0.00697 ± 0.00803	0 ± 0.00004	0 ± 0.00012	0.01683 ± 0.01218
WELBY	01/19/97	18	12	0.05845 ± 0.03429	0.06151 ± 0.04177	0.07918 ± 0.01579	0.01586 ± 0.01826	0 ± 0.00004	0 ± 0.00015	0.00365 ± 0.00264
WELBY	01/20/97	06	6	0.00183 ± 0.00108	0.02653 ± 0.01802	0.0397 ± 0.00792	0.02643 ± 0.03043	0 ± 0.00005	0 ± 0.00022	0.04672 ± 0.03379
WELBY	01/20/97	12	6	-99 ± -99	0.0043 ± 0.00292	0.00175 ± 0.00035	0.01767 ± 0.02034	0 ± 0.00005	0 ± 0.00017	0.02508 ± 0.01814
WELBY	01/20/97	18	12	-99 ± -99	-0.0059 ± 0.00401	0.05668 ± 0.01131	0.00624 ± 0.00719	0 ± 0.00007	0 ± 0.00028	-0.00681 ± 0.00492
WELBY	01/27/97	06	6	-99 ± -99	0.12563 ± 0.08531	0.008 ± 0.0016	0.01407 ± 0.01621	0 ± 0.00026	0 ± 0.0005	-0.01126 ± 0.00815
WELBY	01/27/97	12	6	-99 ± -99	-0.01283 ± 0.00871	0.00133 ± 0.00027	0.00422 ± 0.00486	0 ± 0.0002	0 ± 0.00034	-0.00179 ± 0.00129
WELBY	01/27/97	18	12	-99 ± -99	0.05042 ± 0.03424	0.00431 ± 0.00086	0.00863 ± 0.00994	0 ± 0.00022	0 ± 0.00049	-0.01626 ± 0.01176
WELBY	01/28/97	06	6	-99 ± -99	-0.02816 ± 0.01912	0.00018 ± 0.00004	0.06847 ± 0.07883	0 ± 0.00006	0 ± 0.00021	0.0467 ± 0.03378
WELBY	01/28/97	12	6	-99 ± -99	-0.0274 ± 0.01861	0.00127 ± 0.00025	0.10044 ± 0.11565	0 ± 0.00012	0 ± 0.00061	0.02699 ± 0.01953
WELBY	01/28/97	18	12	-99 ± -99	-0.00168 ± 0.00114	0.00217 ± 0.00043	0.03693 ± 0.04252	0 ± 0.00012	0 ± 0.00032	0.00306 ± 0.00221
WELBY	01/29/97	06	6	-99 ± -99	-0.01703 ± 0.01157	0.00228 ± 0.00045	0.00676 ± 0.00778	0 ± 0.0002	0 ± 0.00063	0.00537 ± 0.00389
WELBY	01/29/97	12	6	-99 ± -99	-0.00976 ± 0.00663	-0.00008 ± 0.00002	0.00748 ± 0.00862	0 ± 0.00018	0 ± 0.00027	0.00429 ± 0.0031
WELBY	01/29/97	18	12	0.002 ± 0.00117	0.01238 ± 0.00841	0.00043 ± 0.00008	0.00659 ± 0.00759	0 ± 0.00011	0 ± 0.00014	0.00749 ± 0.00542
WELBY	01/30/97	06	6	0.01775 ± 0.01041	0.02244 ± 0.01524	0.09393 ± 0.01874	0.06364 ± 0.07327	0 ± 0.00007	0 ± 0.00016	0.03581 ± 0.02591
WELBY	01/30/97	12	6	0.01412 ± 0.00828	-0.00079 ± 0.00053	0.00531 ± 0.00106	0.01263 ± 0.01455	0 ± 0.00001	0 ± 0.00003	0.0218 ± 0.01577
WELBY	01/30/97	18	12	0.0113 ± 0.00663	-0.00673 ± 0.00457	0.0023 ± 0.00046	0.00358 ± 0.00412	0 ± 0.00002	0 ± 0.00001	0.00186 ± 0.00134

Table C.1A-5
Contributions to Sulfur Dioxide at Core Sites for Individual Samples - NFRAQS Winter 1996/97, Extended Species CMB

Site ID	Date	Start Hour	Duration (hrs)	Sulfur Dioxide (µg/m^3)	R-square	Chi-square	Percent of Mass	Incremental cold start ("puffers")	Hot stabilized, non-smoking	Smoking LDGV exhaust	Diesel Exhaust
BRIGHT	12/18/96	06	6	13.7707 ± 5.18617	0.94696	0.24884	107.156	-0.15465 ± 0.16573	0.15755 ± 0.11992	0.60472 ± 0.33761	0.63302 ± 0.46348
BRIGHT	12/18/96	12	6	2.65827 ± 5.00706	0.86814	0.4292	67.2689	-0.04815 ± 0.0516	0.18043 ± 0.13733	0.29936 ± 0.16713	0.12882 ± 0.09432
BRIGHT	12/18/96	18	12	7.50417 ± 5.056	0.91877	0.55765	174.449	0.08291 ± 0.08885	0.29105 ± 0.22153	0.39655 ± 0.22139	0.77803 ± 0.56965
BRIGHT	12/19/96	06	6	16.6905 ± 5.27122	0.90093	0.71493	97.5913	0.49126 ± 0.52645	0.90999 ± 0.69263	0.75589 ± 0.42201	0.6062 ± 0.44384
BRIGHT	12/19/96	12	6	20.9176 ± 5.41991	0.95264	0.28973	87.797	0.81912 ± 0.87779	1.47844 ± 1.1253	0.75653 ± 0.42237	1.16748 ± 0.8548
BRIGHT	12/19/96	18	12	4.25822 ± 5.0181	0.95264	0.27804	97.5091	0.1998 ± 0.21411	0.65525 ± 0.49874	0.20931 ± 0.11686	0.37694 ± 0.27599
BRIGHT	12/20/96	06	6	0 ± 5	0.94627	0.1404	98.4816	-0.21688 ± 0.23242	0.07036 ± 0.05356	0.3277 ± 0.18295	0.57768 ± 0.42296
BRIGHT	12/25/96	06	6	0.26147 ± 5.00007	0.82737	0.3782	122.389	0.00959 ± 0.01028	0.37331 ± 0.28415	0.26407 ± 0.14743	0.13465 ± 0.09858
BRIGHT	12/25/96	12	6	0.78441 ± 5.00062	0.86192	0.49436	116.647	-0.03509 ± 0.03761	0.19935 ± 0.15174	0.21321 ± 0.11903	0.04617 ± 0.03381
BRIGHT	12/25/96	18	12	0 ± 5	0.90966	0.38346	111.531	0.02797 ± 0.02997	0.01025 ± 0.0078	0.04838 ± 0.02701	0.10408 ± 0.0762
BRIGHT	12/26/96	06	6	4.4014 ± 5.01933	0.95011	0.23806	85.5113	0.05262 ± 0.05639	0.02789 ± 0.02123	0.2661 ± 0.14856	0.23012 ± 0.16849
BRIGHT	12/26/96	12	6	0 ± 5	0.91168	0.4276	114.996	0.1013 ± 0.10856	0.20577 ± 0.15662	0.0145 ± 0.0081	0.17187 ± 0.12584
BRIGHT	12/26/96	18	12	0.96744 ± 5.00094	0.94882	0.26857	120.921	0.11946 ± 0.12802	0.24993 ± 0.19023	0.09819 ± 0.05482	0.19072 ± 0.13964
BRIGHT	12/30/96	06	6	7.23399 ± 5.05206	0.90027	0.34308	107.852	0.0454 ± 0.04865	0.86697 ± 0.65988	0.10231 ± 0.05712	0.48206 ± 0.35295
BRIGHT	12/30/96	12	6	6.88536 ± 5.04719	0.8281	0.45871	97.5083	-0.09424 ± 0.10099	0.91975 ± 0.70006	0.11127 ± 0.06212	0.53185 ± 0.38941
BRIGHT	12/30/96	18	12	6.92894 ± 5.04778	0.91522	0.48103	109.215	0.18254 ± 0.19562	0.33046 ± 0.25153	0.09994 ± 0.0558	0.38359 ± 0.28085
BRIGHT	12/31/96	06	6	9.19501 ± 5.08385	0.95116	0.21564	108.314	-0.2501 ± 0.26802	0.0402 ± 0.0306	0.57283 ± 0.31981	1.09181 ± 0.79939
BRIGHT	12/31/96	12	6	18.9565 ± 5.34729	0.92289	0.39994	134.718	0.04877 ± 0.05227	0.27715 ± 0.21095	0.26358 ± 0.14715	0.73622 ± 0.53904
BRIGHT	12/31/96	18	12	10.5111 ± 5.10929	0.88751	0.5466	117.748	0.27284 ± 0.29239	0.29688 ± 0.22597	0.23295 ± 0.13005	0.40312 ± 0.29515
BRIGHT	01/01/97	06	6	13.2914 ± 5.17365	0.89792	0.39318	113.824	0.38681 ± 0.41452	0.4065 ± 0.3094	0.13903 ± 0.07762	-0.03536 ± 0.02589
BRIGHT	01/01/97	12	6	26.9749 ± 5.68124	0.87896	0.65062	134.745	0.27733 ± 0.2972	0.18317 ± 0.13942	0.49682 ± 0.27737	0.66468 ± 0.48666
BRIGHT	01/01/97	18	12	20.6561 ± 5.40987	0.92624	0.41979	127.122	0.09371 ± 0.10042	0.31279 ± 0.23808	0.28744 ± 0.16048	0.38091 ± 0.27889
BRIGHT	01/02/97	06	6	12.507 ± 5.15405	0.90415	0.30344	110.666	0.17636 ± 0.18899	0.62677 ± 0.47706	0.39882 ± 0.22266	0.64642 ± 0.47329
BRIGHT	01/02/97	12	6	10.4152 ± 5.10732	0.88166	0.41006	142.416	-0.06526 ± 0.06993	0.82216 ± 0.62578	0.38194 ± 0.21323	0.47517 ± 0.34791
BRIGHT	01/02/97	18	12	9.8051 ± 5.09523	0.94117	0.30128	156.115	0.29666 ± 0.31791	0.31021 ± 0.23612	0.24398 ± 0.13621	0.48094 ± 0.35213
BRIGHT	01/06/97	06	6	1.43808 ± 5.00207	0.91285	0.28958	109.72	-99 ± -99	1.09915 ± 0.83661	0.03881 ± 0.02167	0.06343 ± 0.04644
BRIGHT	01/06/97	12	6	1.83029 ± 5.00335	0.97759	0.08534	110.339	-0.17614 ± 0.18875	0.06518 ± 0.04961	0.26967 ± 0.15056	0.44669 ± 0.32705
BRIGHT	01/06/97	18	12	4.94177 ± 5.02436	0.947	0.30669	96.1483	-0.0301 ± 0.03226	0.12718 ± 0.0968	0.30496 ± 0.17026	0.60515 ± 0.44308
BRIGHT	01/07/97	06	6	19.2616 ± 5.35818	0.9656	0.15628	103.44	-0.30719 ± 0.3292	-0.18053 ± 0.13741	0.55045 ± 0.30731	1.20788 ± 0.88437
BRIGHT	01/07/97	12	6	32.9451 ± 5.98781	0.9621	0.19814	102.617	-0.00294 ± 0.00315	0.22273 ± 0.16953	0.4559 ± 0.25453	1.00573 ± 0.73636
BRIGHT	01/07/97	18	12	2.9546 ± 5.00872	0.95963	0.20596	107.482	0.03061 ± 0.0328	0.39402 ± 0.2999	0.10715 ± 0.05982	0.11721 ± 0.08582
BRIGHT	01/08/97	06	6	6.62389 ± 5.04368	0.97186	0.13964	93.4303	0.50301 ± 0.53904	0.07402 ± 0.05634	0.44321 ± 0.24744	0.72492 ± 0.53077
BRIGHT	01/12/97	06	6	0.47936 ± 5.00023	0.8585	0.32911	59.4525	-0.08334 ± 0.08931	0.1253 ± 0.09537	0.10364 ± 0.05786	0.07584 ± 0.05553
BRIGHT	01/12/97	12	6	0.78441 ± 5.00062	0.9147	0.2786	83.8301	-0.093 ± 0.09967	0.11397 ± 0.08675	0.15942 ± 0.089	0.10438 ± 0.07642
BRIGHT	01/12/97	18	12	1.01973 ± 5.00104	0.88073	0.6962	91.9326	-0.01704 ± 0.01826	0.02393 ± 0.01822	0.41584 ± 0.23216	0.42795 ± 0.31333

Table C.1A-5 (continued)
Contributions to Sulfur Dioxide at Core Sites for Individual Samples - NFRAQS Winter 1996/97, Extended Species CMB

Site ID	Date	Start Hour	Duration (hrs)	Meat Cooking	Wood Combustion (Softwood)	Wood Combustion (Hardwood)	Paved Road Dust	Ammonium Sulfate	Ammonium Nitrate	Coal-Fired Powerplant
BRIGHT	12/18/96	06	6	0 ± 0.00535	0.0006 ± 0.00027	-0.00044 ± 0.00016	0 ± 0.00801	0 ± 0.0108	0 ± 0.01657	1.85231 ± 0.37046
BRIGHT	12/18/96	12	6	0 ± 0.00314	0.00037 ± 0.00016	-0.00133 ± 0.00048	0 ± 0.01396	0 ± 0.00622	0 ± 0.00617	35.8516 ± 7.17033
BRIGHT	12/18/96	18	12	-99 ± -99	0.002 ± 0.00088	0.00113 ± 0.00041	0 ± 0.00477	0 ± 0.01273	0 ± 0.01511	-8.97842 ± 1.79568
BRIGHT	12/19/96	06	6	0 ± 0.00278	0.01272 ± 0.00559	0.00223 ± 0.00081	0 ± 0.01155	0 ± 0.02207	0 ± 0.03871	-11.8312 ± 2.36624
BRIGHT	12/19/96	12	6	-99 ± -99	0.00291 ± 0.00128	0.0128 ± 0.00465	0 ± 0.02011	0 ± 0.03455	0 ± 0.11016	-29.8175 ± 5.96351
BRIGHT	12/19/96	18	12	-99 ± -99	0.00145 ± 0.00064	0.00048 ± 0.00018	0 ± 0.00433	0 ± 0.0071	0 ± 0.01592	-11.1752 ± 2.23505
BRIGHT	12/20/96	06	6	-99 ± -99	0.00029 ± 0.00013	-0.00035 ± 0.00013	0 ± 0.00604	0 ± 0.0028	0 ± 0.01042	6.95799 ± 1.3916
BRIGHT	12/25/96	06	6	0 ± 0.0014	0.0019 ± 0.00084	-0.00008 ± 0.00003	0 ± 0.00633	0 ± 0.00112	0 ± 0.00285	6.7554 ± 1.35108
BRIGHT	12/25/96	12	6	0 ± 0.00216	0.00042 ± 0.00018	-0.00031 ± 0.00011	0 ± 0.00708	0 ± 0.00433	0 ± 0.01192	12.9576 ± 2.59151
BRIGHT	12/25/96	18	12	-99 ± -99	0.00029 ± 0.00013	0.00127 ± 0.00046	0 ± 0.00395	0 ± 0.02691	0 ± 0.06412	-4.19654 ± 0.83931
BRIGHT	12/26/96	06	6	-99 ± -99	0.00094 ± 0.00041	-0.00093 ± 0.00034	0 ± 0.01372	0 ± 0.03167	0 ± 0.06604	9.44508 ± 1.88902
BRIGHT	12/26/96	12	6	0 ± 0.00628	0.00091 ± 0.0004	0.00381 ± 0.00138	0 ± 0.01779	0 ± 0.02781	0 ± 0.06269	11.09 ± 2.218
BRIGHT	12/26/96	18	12	-99 ± -99	0.00049 ± 0.00022	0.0004 ± 0.00014	0 ± 0.01014	0 ± 0.01595	0 ± 0.03581	10.6879 ± 2.13757
BRIGHT	12/30/96	06	6	0 ± 0.00675	0.0001 ± 0.00004	0.00871 ± 0.00316	0 ± 0.01169	0 ± 0.00424	0 ± 0.00388	22.9167 ± 4.58335
BRIGHT	12/30/96	12	6	0 ± 0.00287	-0.00137 ± 0.0006	0.00681 ± 0.00247	0 ± 0.01615	0 ± 0.00491	0 ± 0.00223	11.7207 ± 2.34413
BRIGHT	12/30/96	18	12	0 ± 0.00118	0.00309 ± 0.00136	0.00813 ± 0.00295	0 ± 0.00925	0 ± 0.0056	0 ± 0.00518	6.57078 ± 1.31416
BRIGHT	12/31/96	06	6	0 ± 0.00391	0.00033 ± 0.00014	-0.00034 ± 0.00012	0 ± 0.02263	0 ± 0.00809	0 ± 0.025	10.5562 ± 2.11124
BRIGHT	12/31/96	12	6	-99 ± -99	-0.00005 ± 0.00002	-0.00019 ± 0.00007	0 ± 0.01857	0 ± 0.00772	0 ± 0.02972	31.114 ± 6.2228
BRIGHT	12/31/96	18	12	-99 ± -99	0.00151 ± 0.00067	0.00027 ± 0.0001	0 ± 0.013	0 ± 0.0033	0 ± 0.00297	10.3624 ± 2.07249
BRIGHT	01/01/97	06	6	-99 ± -99	-99 ± -99	0.00295 ± 0.00107	0 ± 0.01161	0 ± 0.00432	0 ± 0.01443	-5.58768 ± 1.11754
BRIGHT	01/01/97	12	6	-99 ± -99	-0.0012 ± 0.00053	0.00071 ± 0.00026	0 ± 0.03523	0 ± 0.01289	0 ± 0.06801	-16.4637 ± 3.29273
BRIGHT	01/01/97	18	12	0 ± 0.00254	-0.00044 ± 0.0002	0.0001 ± 0.00004	0 ± 0.01571	0 ± 0.00463	0 ± 0.00851	4.9332 ± 0.98664
BRIGHT	01/02/97	06	6	0 ± 0.00204	-0.00056 ± 0.00025	0.00284 ± 0.00103	0 ± 0.02584	0 ± 0.00265	0 ± 0.00215	23.7623 ± 4.75246
BRIGHT	01/02/97	12	6	-99 ± -99	-0.00073 ± 0.00032	-0.00004 ± 0.00001	0 ± 0.03053	0 ± 0.00401	0 ± 0.00475	3.27794 ± 0.65559
BRIGHT	01/02/97	18	12	0 ± 0.00283	0.00015 ± 0.00007	0.00004 ± 0.00001	0 ± 0.01748	0 ± 0.00525	0 ± 0.01119	3.16304 ± 0.63261
BRIGHT	01/06/97	06	6	-99 ± -99	0.00893 ± 0.00393	0.00407 ± 0.00148	0 ± 0.00258	0 ± 0.00264	0 ± 0.02182	2.82915 ± 0.56583
BRIGHT	01/06/97	12	6	0 ± 0.00249	0.00008 ± 0.00003	-0.00012 ± 0.00004	0 ± 0.00258	0 ± 0.00735	0 ± 0.03565	-0.08499 ± 0.017
BRIGHT	01/06/97	18	12	0 ± 0.00267	-0.00006 ± 0.00003	0.00147 ± 0.00053	0 ± 0.00468	0 ± 0.01081	0 ± 0.02707	-3.4049 ± 0.68098
BRIGHT	01/07/97	06	6	-99 ± -99	0.0004 ± 0.00018	-0.00047 ± 0.00017	0 ± 0.01519	0 ± 0.01018	0 ± 0.03988	1.79757 ± 0.35951
BRIGHT	01/07/97	12	6	0 ± 0.00508	-0.00125 ± 0.00055	0.00078 ± 0.00028	0 ± 0.02996	0 ± 0.01178	0 ± 0.07295	18.7355 ± 3.7471
BRIGHT	01/07/97	18	12	-99 ± -99	-0.00013 ± 0.00006	0.00127 ± 0.00046	0 ± 0.01257	0 ± 0.00797	0 ± 0.01962	-0.13115 ± 0.02623
BRIGHT	01/08/97	06	6	-99 ± -99	0.00034 ± 0.00015	-0.00023 ± 0.00008	0 ± 0.00733	0 ± 0.01975	0 ± 0.07935	9.14148 ± 1.8283
BRIGHT	01/12/97	06	6	0 ± 0.00214	0.00071 ± 0.00031	0.00071 ± 0.00026	0 ± 0.00247	0 ± 0.0083	0 ± 0.00349	-2.95412 ± 0.59082
BRIGHT	01/12/97	12	6	-99 ± -99	0.00119 ± 0.00052	-0.00007 ± 0.00003	0 ± 0.00486	0 ± 0.00862	0 ± 0.00851	5.39384 ± 1.07877
BRIGHT	01/12/97	18	12	-99 ± -99	-0.00021 ± 0.00009	0.00323 ± 0.00117	0 ± 0.02034	0 ± 0.01557	0 ± 0.04112	10.4467 ± 2.08934

Table C.1A-5 (continued)
Contributions to Sulfur Dioxide at Core Sites for Individual Samples - NFRAQS Winter 1996/97, Extended Species CMB

Site ID	Date	Start Hour	Duration (hrs)	Sulfur Dioxide (µg/m^3)	R-square	Chi-square	Percent of Mass	Incremental cold start ("puffers")	Hot stabilized, non-smoking	Smoking LDGV exhaust	Diesel Exhaust
BRIGHT	01/13/97	06	6	1.30735 ± 5.00171	0.96715	0.16167	104.478	-0.16947 ± 0.18161	-0.00353 ± 0.00269	0.60333 ± 0.33684	0.56288 ± 0.41212
BRIGHT	01/13/97	12	6	10.1102 ± 5.10119	0.96866	0.1359	83.0781	-0.3232 ± 0.34635	-0.11879 ± 0.09041	0.6902 ± 0.38533	0.56977 ± 0.41717
BRIGHT	01/13/97	18	12	22.3818 ± 5.47809	0.95778	0.25771	90.2663	0.023 ± 0.02465	0.19801 ± 0.15071	0.65414 ± 0.3652	0.81786 ± 0.59881
BRIGHT	01/14/97	06	6	69.4201 ± 8.55521	0.95196	0.28788	91.2966	0.47408 ± 0.50804	-0.12614 ± 0.09601	0.96141 ± 0.53675	0.82679 ± 0.60535
BRIGHT	01/14/97	12	6	28.3259 ± 5.74661	0.96109	0.19749	69.8811	-0.15418 ± 0.16522	0.57281 ± 0.43599	0.52113 ± 0.29094	0.34166 ± 0.25015
BRIGHT	01/14/97	18	12	22.8001 ± 5.49531	0.95692	0.28384	97.1516	0.246 ± 0.26362	0.40154 ± 0.30563	0.59484 ± 0.3321	0.64025 ± 0.46878
BRIGHT	01/15/97	06	6	13.3872 ± 5.17612	0.95308	0.22366	62.4223	-0.20846 ± 0.22339	0.46722 ± 0.35562	0.39228 ± 0.219	0.34415 ± 0.25198
BRIGHT	01/15/97	12	6	1.83029 ± 5.00335	0.94333	0.28034	116.239	0.01443 ± 0.01547	0.29658 ± 0.22574	0.16639 ± 0.09289	0.18166 ± 0.13301
BRIGHT	01/15/97	18	12	1.01973 ± 5.00104	0.96899	0.13518	98.3563	-0.17933 ± 0.19217	0.2188 ± 0.16654	0.20271 ± 0.11317	0.12282 ± 0.08993
BRIGHT	01/16/97	06	6	2.52754 ± 5.00638	0.95821	0.20078	91.6799	-0.15754 ± 0.16882	0.25071 ± 0.19082	0.31366 ± 0.17512	0.49743 ± 0.3642
BRIGHT	01/16/97	12	6	1.48166 ± 5.00219	0.96945	0.13287	92.5676	-0.25344 ± 0.27159	-0.01282 ± 0.00976	0.42955 ± 0.23981	0.32654 ± 0.23908
BRIGHT	01/16/97	18	12	7.63491 ± 5.05796	0.91445	0.58308	89.7666	0.06786 ± 0.07272	-0.07373 ± 0.05612	0.49422 ± 0.27592	0.77095 ± 0.56447
BRIGHT	01/17/97	06	6	19.5231 ± 5.36763	0.93106	0.44455	95.7647	0.43158 ± 0.4625	0.38741 ± 0.29488	0.95069 ± 0.53076	1.53484 ± 1.12376
BRIGHT	01/17/97	12	6	17.257 ± 5.28943	0.95877	0.23938	97.3321	0.70899 ± 0.75978	0.46076 ± 0.3507	0.26889 ± 0.15012	0.92473 ± 0.67706
BRIGHT	01/17/97	18	12	29.9383 ± 5.82778	0.93145	0.40475	88.3774	0.46409 ± 0.49734	0.05887 ± 0.04481	0.49605 ± 0.27694	1.21329 ± 0.88834
BRIGHT	01/18/97	06	6	13.3785 ± 5.17589	0.92153	0.37625	141.516	0.43357 ± 0.46463	0.61978 ± 0.47174	0.42118 ± 0.23514	0.65695 ± 0.481
BRIGHT	01/18/97	12	6	10.0927 ± 5.10085	0.94237	0.24048	113.987	0.60295 ± 0.64614	0.07822 ± 0.05954	0.23871 ± 0.13327	0.40857 ± 0.29914
BRIGHT	01/18/97	18	12	7.45188 ± 5.05522	0.92797	0.40816	101.699	0.18299 ± 0.1961	0.03411 ± 0.02596	0.33471 ± 0.18686	0.46799 ± 0.34265
BRIGHT	01/19/97	06	6	8.97712 ± 5.07995	0.93331	0.25646	157.052	-0.20022 ± 0.21456	0.23272 ± 0.17714	0.39357 ± 0.21973	0.45659 ± 0.3343
BRIGHT	01/19/97	12	6	3.52984 ± 5.01244	0.86155	0.43767	104.965	-0.09412 ± 0.10087	0.02635 ± 0.02005	0.55456 ± 0.30961	0.29292 ± 0.21447
BRIGHT	01/19/97	18	12	12.3152 ± 5.14943	0.96338	0.21055	90.0162	0.65476 ± 0.70166	0.36261 ± 0.276	0.46544 ± 0.25985	0.57393 ± 0.42022
BRIGHT	01/20/97	06	6	13.3785 ± 5.17589	0.904	0.4892	93.451	0.0469 ± 0.05026	0.97586 ± 0.74277	0.57755 ± 0.32244	1.01589 ± 0.7438
BRIGHT	01/20/97	12	6	5.83948 ± 5.03398	0.90779	0.43139	128.735	-0.09285 ± 0.0995	0.38666 ± 0.29431	0.40706 ± 0.22726	1.25491 ± 0.91881
BRIGHT	01/27/97	06	6	0.30505 ± 5.00009	0.96685	0.13429	89.2059	-0.06274 ± 0.06723	-0.10917 ± 0.08309	0.17732 ± 0.099	0.18901 ± 0.13839
BRIGHT	01/27/97	12	6	0.08716 ± 5.00001	0.92615	0.27244	94.4204	0.16106 ± 0.1726	-0.05304 ± 0.04037	-0.0178 ± 0.00994	0.08895 ± 0.06512
BRIGHT	01/27/97	18	12	2.53625 ± 5.00643	0.93919	0.35318	99.0156	0.4319 ± 0.46284	-0.0109 ± 0.0083	0.30214 ± 0.16868	0.49536 ± 0.36269
BRIGHT	01/28/97	12	6	27.4543 ± 5.70415	0.94523	0.28944	76.6791	0.90155 ± 0.96613	-0.25595 ± 0.19481	0.40728 ± 0.22738	0.74007 ± 0.54186
BRIGHT	01/28/97	18	12	1.43808 ± 5.00207	0.91035	0.48349	86.72	0.07771 ± 0.08327	0.32643 ± 0.24846	0.08008 ± 0.04471	0.11275 ± 0.08255
BRIGHT	01/29/97	06	6	1.51652 ± 5.0023	0.95747	0.19574	102.231	1.00554 ± 1.07757	-0.32633 ± 0.24838	0.06933 ± 0.03871	-0.18746 ± 0.13725
BRIGHT	01/29/97	12	6	0.20918 ± 5.00004	0.92903	0.33933	114.113	0.37243 ± 0.39911	0.31208 ± 0.23754	0.0346 ± 0.01932	0.08707 ± 0.06375
BRIGHT	01/29/97	18	12	0.3922 ± 5.00015	0.95258	0.23933	104.998	-0.02493 ± 0.02671	0.02125 ± 0.01618	0.21992 ± 0.12278	0.3916 ± 0.28672
BRIGHT	01/30/97	06	6	9.10785 ± 5.08228	0.90171	0.48854	124.391	0.20932 ± 0.22431	0.23963 ± 0.18239	0.59634 ± 0.33293	0.70628 ± 0.51712
BRIGHT	01/30/97	12	6	4.92434 ± 5.02419	0.87866	0.24076	125.023	-0.10148 ± 0.10875	0.30969 ± 0.23572	0.29045 ± 0.16216	0.17048 ± 0.12482
BRIGHT	01/30/97	18	12	0.29052 ± 5.00008	0.89778	0.33437	155.019	-0.00522 ± 0.0056	0.16666 ± 0.12685	0.17483 ± 0.09761	0.24833 ± 0.18182

Table C.1A-5 (continued)
Contributions to Sulfur Dioxide at Core Sites for Individual Samples - NFRAQS Winter 1996/97, Extended Species CMB

Site ID	Date	Start Hour	Duration (hrs)	Meat Cooking	Wood Combustion (Softwood)	Wood Combustion (Hardwood)	Paved Road Dust	Ammonium Sulfate	Ammonium Nitrate	Coal-Fired Powerplant
BRIGHT	01/13/97	06	6	-99 ± -99	-0.00063 ± 0.00028	0.00147 ± 0.00053	0 ± 0.00929	0 ± 0.02186	0 ± 0.06083	22.584 ± 4.5168
BRIGHT	01/13/97	12	6	-99 ± -99	-0.00001 ± 0	0.00193 ± 0.0007	0 ± 0.01445	0 ± 0.03453	0 ± 0.08363	-7.83965 ± 1.56793
BRIGHT	01/13/97	18	12	-99 ± -99	0.0004 ± 0.00018	0.00474 ± 0.00172	0 ± 0.01254	0 ± 0.03152	0 ± 0.10435	-10.1923 ± 2.03846
BRIGHT	01/14/97	06	6	0 ± 0.00228	0.00166 ± 0.00073	0.01536 ± 0.00558	0 ± 0.01673	0 ± 0.04964	0 ± 0.11984	0.67666 ± 0.13533
BRIGHT	01/14/97	12	6	0 ± 0.00172	0.00211 ± 0.00093	-0.00071 ± 0.00026	0 ± 0.00435	0 ± 0.03152	0 ± 0.04658	-11.6976 ± 2.33952
BRIGHT	01/14/97	18	12	0 ± 0.00353	0.00291 ± 0.00128	0.00232 ± 0.00084	0 ± 0.00664	0 ± 0.0472	0 ± 0.05256	-22.79 ± 4.558
BRIGHT	01/15/97	06	6	0 ± 0.00294	0.00057 ± 0.00025	0.00127 ± 0.00046	0 ± 0.01486	0 ± 0.01866	0 ± 0.01654	10.0054 ± 2.00107
BRIGHT	01/15/97	12	6	0 ± 0.00301	0.00095 ± 0.00042	-0.00003 ± 0.00001	0 ± 0.00431	0 ± 0.01634	0 ± 0.02162	4.55425 ± 0.91085
BRIGHT	01/15/97	18	12	0 ± 0.00067	0.00045 ± 0.0002	-0.00019 ± 0.00007	0 ± 0.00504	0 ± 0.01803	0 ± 0.01313	11.2934 ± 2.25869
BRIGHT	01/16/97	06	6	-99 ± -99	0.00025 ± 0.00011	0.00021 ± 0.00008	0 ± 0.00608	0 ± 0.0164	0 ± 0.02343	31.5015 ± 6.3003
BRIGHT	01/16/97	12	6	0 ± 0.00131	0.00127 ± 0.00056	0.00082 ± 0.0003	0 ± 0.01045	0 ± 0.01958	0 ± 0.02169	0.1017 ± 0.02034
BRIGHT	01/16/97	18	12	-99 ± -99	0.00476 ± 0.00209	0.00347 ± 0.00126	0 ± 0.01661	0 ± 0.02748	0 ± 0.05907	18.9519 ± 3.79038
BRIGHT	01/17/97	06	6	-99 ± -99	0.00205 ± 0.0009	0.0091 ± 0.00331	0 ± 0.02274	0 ± 0.05322	0 ± 0.11545	-5.0276 ± 1.00552
BRIGHT	01/17/97	12	6	0 ± 0.01603	0.009 ± 0.00396	0.00437 ± 0.00159	0 ± 0.01253	0 ± 0.03967	0 ± 0.16802	-6.48804 ± 1.29761
BRIGHT	01/17/97	18	12	-99 ± -99	0.00005 ± 0.00002	0.00427 ± 0.00155	0 ± 0.02629	0 ± 0.02552	0 ± 0.08829	-28.8203 ± 5.76407
BRIGHT	01/18/97	06	6	-99 ± -99	0.00135 ± 0.00059	0.00305 ± 0.00111	0 ± 0.0077	0 ± 0.00362	0 ± 0.01691	-5.39509 ± 1.07902
BRIGHT	01/18/97	12	6	-99 ± -99	-0.00011 ± 0.00005	0.00219 ± 0.0008	0 ± 0.00576	0 ± 0.00392	0 ± 0.03403	8.21148 ± 1.6423
BRIGHT	01/18/97	18	12	-99 ± -99	0.00431 ± 0.00189	0.00307 ± 0.00111	0 ± 0.00618	0 ± 0.00519	0 ± 0.038	-9.29125 ± 1.85825
BRIGHT	01/19/97	06	6	-99 ± -99	0.00079 ± 0.00035	0.00094 ± 0.00034	0 ± 0.00285	0 ± 0.00422	0 ± 0.03039	17.9391 ± 3.58782
BRIGHT	01/19/97	12	6	0 ± 0.00263	-0.00012 ± 0.00005	-0.00058 ± 0.00021	0 ± 0.01333	0 ± 0.00181	0 ± 0.01143	9.37065 ± 1.87413
BRIGHT	01/19/97	18	12	0 ± 0.00074	0.00009 ± 0.00004	0.00654 ± 0.00238	0 ± 0.0071	0 ± 0.01578	0 ± 0.11792	-14.5694 ± 2.91387
BRIGHT	01/20/97	06	6	-99 ± -99	0.00031 ± 0.00014	0.0045 ± 0.00164	0 ± 0.0312	0 ± 0.00361	0 ± 0.01544	30.4334 ± 6.08668
BRIGHT	01/20/97	12	6	-99 ± -99	0.00078 ± 0.00034	0.00254 ± 0.00092	0 ± 0.00876	0 ± 0.00324	0 ± 0.03833	33.0959 ± 6.61917
BRIGHT	01/27/97	06	6	0 ± 0.00106	0.00046 ± 0.0002	0.00052 ± 0.00019	0 ± 0.00405	0 ± 0.01782	0 ± 0.03636	-8.37628 ± 1.67526
BRIGHT	01/27/97	12	6	0 ± 0.0076	0.00001 ± 0	0.00049 ± 0.00018	0 ± 0.00151	0 ± 0.01123	0 ± 0.01282	6.62291 ± 1.32458
BRIGHT	01/27/97	18	12	-99 ± -99	0.00016 ± 0.00007	0.00292 ± 0.00106	0 ± 0.01072	0 ± 0.01593	0 ± 0.04487	-16.7182 ± 3.34363
BRIGHT	01/28/97	12	6	-99 ± -99	0.00036 ± 0.00016	0.0071 ± 0.00258	0 ± 0.01975	0 ± 0.02606	0 ± 0.10642	-11.8493 ± 2.36985
BRIGHT	01/28/97	18	12	0 ± 0.00262	-0.00067 ± 0.0003	0.00123 ± 0.00045	0 ± 0.0017	0 ± 0.00829	0 ± 0.02107	1.30575 ± 0.26115
BRIGHT	01/29/97	06	6	0 ± 0.01561	-0.00028 ± 0.00012	-0.00017 ± 0.00006	0 ± 0.00844	0 ± 0.01414	0 ± 0.03222	15.8608 ± 3.17216
BRIGHT	01/29/97	12	6	0 ± 0.011	0.00057 ± 0.00025	-0.00077 ± 0.00028	0 ± 0.00211	0 ± 0.01462	0 ± 0.01933	-3.42714 ± 0.68543
BRIGHT	01/29/97	18	12	-99 ± -99	-0.00008 ± 0.00004	-0.00026 ± 0.00009	0 ± 0.00235	0 ± 0.00874	0 ± 0.009	7.13224 ± 1.42645
BRIGHT	01/30/97	06	6	0 ± 0.00132	0.00023 ± 0.0001	-0.00001 ± 0	0 ± 0.01556	0 ± 0.00282	0 ± 0.01417	38.863 ± 7.7726
BRIGHT	01/30/97	12	6	-99 ± -99	-0.00015 ± 0.00007	-0.00021 ± 0.00008	0 ± 0.00713	0 ± 0.00147	0 ± 0.00486	21.3276 ± 4.26553
BRIGHT	01/30/97	18	12	-99 ± -99	-0.00018 ± 0.00008	-0.00005 ± 0.00002	0 ± 0.00337	0 ± 0.00212	0 ± 0.00175	9.95577 ± 1.99115

Table C.1A-5 (continued)
Contributions to Sulfur Dioxide at Core Sites for Individual Samples - NFRAQS Winter 1996/97, Extended Species CMB

Site ID	Date	Start Hour	Duration (hrs)	Sulfur Dioxide (µg/m^3)	R-square	Chi-square	Percent of Mass	Incremental cold start ("puffers")	Hot stabilized, non-smoking	Smoking LDGV exhaust	Diesel Exhaust
WELBY	12/18/96	12	6	5.22939 ± 5.02727	0.90377	0.4508	107.705	-0.0438 ± 0.04694	1.09308 ± 0.83199	0.23703 ± 0.13233	0.31862 ± 0.23328
WELBY	12/19/96	06	6	38.3488 ± 6.3013	0.927	0.49731	112.131	0.29779 ± 0.31913	3.08643 ± 2.34922	0.74261 ± 0.4146	1.15345 ± 0.84452
WELBY	12/19/96	12	6	41.8351 ± 6.51934	0.93103	0.42077	94.2949	0.81384 ± 0.87214	2.32227 ± 1.76758	0.65925 ± 0.36805	1.30977 ± 0.95898
WELBY	12/19/96	18	12	26.6223 ± 5.66458	0.87751	0.8296	98.3231	1.31083 ± 1.40473	2.71496 ± 2.06647	-0.11792 ± 0.06583	0.76687 ± 0.56148
WELBY	12/20/96	06	6	40.5278 ± 6.43622	0.89281	0.57922	107.337	2.99042 ± 3.20463	3.82 ± 2.90756	-0.18007 ± 0.10053	1.07856 ± 0.78969
WELBY	12/25/96	06	6	7.84408 ± 5.06116	0.93949	0.28542	105.787	0.00988 ± 0.01059	0.4728 ± 0.35987	0.3545 ± 0.19791	0.45944 ± 0.33638
WELBY	12/25/96	12	6	3.92204 ± 5.01536	0.86983	0.39052	123.483	-0.05783 ± 0.06198	0.45928 ± 0.34958	0.31966 ± 0.17846	0.12452 ± 0.09117
WELBY	12/25/96	18	12	1.9016 ± 5.00361	0.96283	0.1544	91.588	-0.09157 ± 0.09813	0.04499 ± 0.03424	0.13255 ± 0.074	0.1846 ± 0.13516
WELBY	12/30/96	06	6	1.74313 ± 5.00304	0.82721	0.7915	135.081	0.7515 ± 0.80533	2.59312 ± 1.97374	0.13348 ± 0.07452	0.64077 ± 0.46915
WELBY	12/30/96	12	6	13.7271 ± 5.18501	0.89613	0.48401	115.822	1.25565 ± 1.3456	1.27581 ± 0.97107	0.22055 ± 0.12313	1.45748 ± 1.06713
WELBY	12/30/96	18	12	5.22939 ± 5.02727	0.93275	0.40653	102.551	1.22604 ± 1.31386	0.68584 ± 0.52202	0.45234 ± 0.25254	1.14413 ± 0.8377
WELBY	12/31/96	06	6	20.046 ± 5.38687	0.92342	0.38811	103.39	-0.20584 ± 0.22059	0.27812 ± 0.21169	0.61723 ± 0.3446	2.27942 ± 1.66892
WELBY	12/31/96	12	6	12.2019 ± 5.14673	0.86193	0.65173	122.643	1.30231 ± 1.3956	0.99127 ± 0.7545	0.30155 ± 0.16835	0.52208 ± 0.38225
WELBY	12/31/96	18	12	4.99169 ± 5.02486	0.84326	0.98928	102.979	1.89518 ± 2.03093	0.38742 ± 0.29488	-99 ± -99	0.8885 ± 0.65053
WELBY	01/01/97	06	6	0.52294 ± 5.00027	0.80837	0.87535	116.785	2.02568 ± 2.17078	2.48173 ± 1.88895	-99 ± -99	-0.31398 ± 0.22988
WELBY	01/01/97	12	6	6.10095 ± 5.03708	0.91336	0.48448	110.43	1.87043 ± 2.00442	2.64848 ± 2.01587	0.04492 ± 0.02508	0.3639 ± 0.26643
WELBY	01/01/97	18	12	9.03258 ± 5.08093	0.86078	1.07183	111.064	-99 ± -99	3.13324 ± 2.38484	0.05168 ± 0.02885	0.95834 ± 0.70167
WELBY	01/02/97	06	6	48.8076 ± 6.98726	0.94831	0.30692	109.491	3.14162 ± 3.36666	3.37602 ± 2.56964	-99 ± -99	2.58671 ± 1.89391
WELBY	01/02/97	12	6	34.4268 ± 6.07059	0.91639	0.45934	111.9	0.35529 ± 0.38074	1.64596 ± 1.25281	0.30929 ± 0.17267	1.06751 ± 0.7816
WELBY	01/02/97	18	12	10.6965 ± 5.11313	0.92603	0.43418	103.929	1.60878 ± 1.72402	2.17694 ± 1.65696	-99 ± -99	0.996 ± 0.72924
WELBY	01/06/97	06	6	3.48626 ± 5.01214	0.9035	0.44255	97.7999	0.50942 ± 0.54591	0.30467 ± 0.23189	-99 ± -99	0.09448 ± 0.06917
WELBY	01/06/97	12	6	12.2019 ± 5.14673	0.93675	0.30957	83.4631	0.87914 ± 0.94212	0.47207 ± 0.35931	-0.20336 ± 0.11353	0.17787 ± 0.13023
WELBY	01/06/97	18	12	13.3112 ± 5.17415	0.91765	0.56058	98.0311	0.00601 ± 0.00644	0.16871 ± 0.12841	0.39773 ± 0.22205	1.01362 ± 0.74214
WELBY	01/07/97	06	6	56.6517 ± 7.55607	0.89877	0.59799	94.7872	2.52731 ± 2.70835	3.07681 ± 2.34189	0.28252 ± 0.15773	0.88882 ± 0.65077
WELBY	01/07/97	12	6	33.4681 ± 6.01674	0.90564	0.53508	98.332	0.24917 ± 0.26701	0.67792 ± 0.516	0.40522 ± 0.22623	0.88318 ± 0.64663
WELBY	01/07/97	18	12	7.13098 ± 5.05059	0.95372	0.26338	84.4171	1.05164 ± 1.12697	1.91231 ± 1.45554	0.11871 ± 0.06628	0.03315 ± 0.02427
WELBY	01/08/97	06	6	12.6377 ± 5.15724	0.92051	0.48359	129.5	2.59332 ± 2.77909	2.33203 ± 1.77501	0.22996 ± 0.12838	1.22243 ± 0.89503
WELBY	01/12/97	06	6	0 ± 5	0.89251	0.43755	103.997	0.63615 ± 0.68172	1.85726 ± 1.41364	-99 ± -99	0.04726 ± 0.0346
WELBY	01/12/97	12	6	0 ± 5	0.90861	0.41414	89.8276	0.55318 ± 0.5928	0.85376 ± 0.64983	-0.00556 ± 0.0031	-0.03661 ± 0.0268
WELBY	01/12/97	18	12	0 ± 5	0.89666	0.68482	99.207	0.62614 ± 0.671	0.41017 ± 0.3122	0.37919 ± 0.2117	0.29697 ± 0.21744
WELBY	01/13/97	06	6	1.74313 ± 5.00304	0.96316	0.19794	94.5547	0.20307 ± 0.21762	0.56341 ± 0.42883	0.67274 ± 0.37559	0.30626 ± 0.22424
WELBY	01/13/97	12	6	16.2111 ± 5.25623	0.97159	0.14584	88.7075	-0.2734 ± 0.29299	-0.09467 ± 0.07206	0.55184 ± 0.30809	0.85457 ± 0.62569
WELBY	01/13/97	18	12	13.7866 ± 5.18659	0.96819	0.19145	90.2272	0.4601 ± 0.49306	0.31312 ± 0.23833	0.63849 ± 0.35646	0.48189 ± 0.35282
WELBY	01/14/97	12	6	21.3533 ± 5.43688	0.97175	0.18661	96.2249	0.64134 ± 0.68728	0.73434 ± 0.55894	0.7501 ± 0.41877	0.88669 ± 0.64921
WELBY	01/14/97	18	12	15.6882 ± 5.24034	0.92315	0.47248	100.198	0.58175 ± 0.62343	0.40394 ± 0.30746	0.29702 ± 0.16583	0.44766 ± 0.32777

Table C.1A-5 (continued)
Contributions to Sulfur Dioxide at Core Sites for Individual Samples - NFRAQS Winter 1996/97, Extended Species CMB

Site ID	Date	Start Hour	Duration (hrs)	Meat Cooking	Wood Combustion (Softwood)	Wood Combustion (Hardwood)	Paved Road Dust	Ammonium Sulfate	Ammonium Nitrate	Coal-Fired Powerplant
WELBY	12/18/96	12	6	0 ± 0.00064	0.00281 ± 0.00124	0.00041 ± 0.00015	0 ± 0.00529	0 ± 0.00584	0 ± 0.01174	15.8159 ± 3.16318
WELBY	12/19/96	06	6	-99 ± -99	0.01323 ± 0.00582	0.00452 ± 0.00164	0 ± 0.02798	0 ± 0.02161	0 ± 0.04295	10.3567 ± 2.07135
WELBY	12/19/96	12	6	-99 ± -99	0.00138 ± 0.00061	0.00075 ± 0.00027	0 ± 0.02551	0 ± 0.03226	0 ± 0.09923	-41.5312 ± 8.30624
WELBY	12/19/96	18	12	0 ± 0.02093	0.00095 ± 0.00042	0.00507 ± 0.00184	0 ± 0.01526	0 ± 0.01659	0 ± 0.02935	-18.1093 ± 3.62185
WELBY	12/20/96	06	6	0 ± 0.00412	0.00422 ± 0.00186	0.04088 ± 0.01485	0 ± 0.04155	0 ± 0.01209	0 ± 0.02395	-20.839 ± 4.16779
WELBY	12/25/96	06	6	0 ± 0.00103	0.00153 ± 0.00067	-0.00038 ± 0.00014	0 ± 0.00781	0 ± 0.0051	0 ± 0.0143	21.6087 ± 4.32173
WELBY	12/25/96	12	6	-99 ± -99	0.00221 ± 0.00097	-0.00211 ± 0.00077	0 ± 0.01059	0 ± 0.00265	0 ± 0.00588	8.08466 ± 1.61693
WELBY	12/25/96	18	12	-99 ± -99	0.00185 ± 0.00082	-0.00064 ± 0.00023	0 ± 0.00635	0 ± 0.02335	0 ± 0.04813	-3.32594 ± 0.66519
WELBY	12/30/96	06	6	0 ± 0.00005	0.00691 ± 0.00304	0.00818 ± 0.00297	0 ± 0.024	0 ± 0.00207	0 ± 0.00899	29.7729 ± 5.95458
WELBY	12/30/96	12	6	-99 ± -99	0.00053 ± 0.00023	0.01279 ± 0.00465	0 ± 0.04968	0 ± 0.00627	0 ± 0.00966	37.8444 ± 7.56887
WELBY	12/30/96	18	12	-99 ± -99	0.00827 ± 0.00364	0.00638 ± 0.00232	0 ± 0.02617	0 ± 0.0075	0 ± 0.01397	-4.93189 ± 0.98638
WELBY	12/31/96	06	6	-99 ± -99	0.00332 ± 0.00146	0.00424 ± 0.00154	0 ± 0.04885	0 ± 0.01337	0 ± 0.04163	73.6124 ± 14.7225
WELBY	12/31/96	12	6	-99 ± -99	0.0014 ± 0.00061	0.01338 ± 0.00486	0 ± 0.0341	0 ± 0.00577	0 ± 0.00772	25.1 ± 5.02001
WELBY	12/31/96	18	12	0 ± 0.01347	0.01562 ± 0.00687	0.06843 ± 0.02486	0 ± 0.02487	0 ± 0.00705	0 ± 0.01029	95.4802 ± 19.096
WELBY	01/01/97	06	6	-99 ± -99	0.01354 ± 0.00596	0.02277 ± 0.00827	0 ± 0.00934	0 ± 0.00348	0 ± 0.01162	46.4962 ± 9.29925
WELBY	01/01/97	12	6	0 ± 0.01022	-0.00149 ± 0.00066	0.01872 ± 0.0068	0 ± 0.02944	0 ± 0.00777	0 ± 0.05634	14.2222 ± 2.84445
WELBY	01/01/97	18	12	-99 ± -99	0.04039 ± 0.01776	0.07624 ± 0.0277	0 ± 0.02355	0 ± 0.00659	0 ± 0.01459	12.9921 ± 2.59842
WELBY	01/02/97	06	6	0 ± 0.01199	0.01154 ± 0.00508	0.02577 ± 0.00936	0 ± 0.06518	0 ± 0.01993	0 ± 0.02926	77.3409 ± 15.4682
WELBY	01/02/97	12	6	0 ± 0.01006	0.00157 ± 0.00069	0.00446 ± 0.00162	0 ± 0.04823	0 ± 0.00756	0 ± 0.01016	49.455 ± 9.89099
WELBY	01/02/97	18	12	0 ± 0.01417	0.01017 ± 0.00447	0.00317 ± 0.00115	0 ± 0.02091	0 ± 0.00638	0 ± 0.01173	25.3883 ± 5.07765
WELBY	01/06/97	06	6	0 ± 0.00599	0.01416 ± 0.00623	-0.00215 ± 0.00078	0 ± 0.00485	0 ± 0.00798	0 ± 0.03318	-7.81216 ± 1.56243
WELBY	01/06/97	12	6	0 ± 0.0195	0.00655 ± 0.00288	-0.00012 ± 0.00004	0 ± 0.02523	0 ± 0.01704	0 ± 0.05353	-34.5383 ± 6.90765
WELBY	01/06/97	18	12	0 ± 0.01292	0.00038 ± 0.00017	-0.00068 ± 0.00025	0 ± 0.03143	0 ± 0.01211	0 ± 0.02225	3.01703 ± 0.60341
WELBY	01/07/97	06	6	-99 ± -99	0.01867 ± 0.00821	0.01567 ± 0.00569	0 ± 0.11452	0 ± 0.0142	0 ± 0.03247	5.91974 ± 1.18395
WELBY	01/07/97	12	6	-99 ± -99	0.00051 ± 0.00023	0.0017 ± 0.00062	0 ± 0.08599	0 ± 0.01045	0 ± 0.0598	-7.98606 ± 1.59721
WELBY	01/07/97	18	12	0 ± 0.00068	0.00107 ± 0.00047	0.00095 ± 0.00035	0 ± 0.03264	0 ± 0.00796	0 ± 0.03268	-10.744 ± 2.1488
WELBY	01/08/97	06	6	-99 ± -99	0.00115 ± 0.00051	0.02108 ± 0.00766	0 ± 0.03172	0 ± 0.01832	0 ± 0.08595	-0.78717 ± 0.15743
WELBY	01/12/97	06	6	-99 ± -99	0.00379 ± 0.00166	0.00265 ± 0.00096	0 ± 0.00359	0 ± 0.00746	0 ± 0.00989	-1.86255 ± 0.37251
WELBY	01/12/97	12	6	-99 ± -99	0.00453 ± 0.00199	0.00085 ± 0.00031	0 ± 0.00393	0 ± 0.00964	0 ± 0.01451	-17.2017 ± 3.44035
WELBY	01/12/97	18	12	-99 ± -99	0.00178 ± 0.00078	-0.00003 ± 0.00001	0 ± 0.01008	0 ± 0.01416	0 ± 0.038	-23.5813 ± 4.71625
WELBY	01/13/97	06	6	0 ± 0.01484	-0.0003 ± 0.00013	0.0006 ± 0.00022	0 ± 0.00659	0 ± 0.01878	0 ± 0.04924	-12.4637 ± 2.49273
WELBY	01/13/97	12	6	0 ± 0.01066	0.00277 ± 0.00122	0.00059 ± 0.00021	0 ± 0.01156	0 ± 0.04338	0 ± 0.10088	-10.657 ± 2.1314
WELBY	01/13/97	18	12	-99 ± -99	0.01179 ± 0.00518	0.00006 ± 0.00002	0 ± 0.00868	0 ± 0.0294	0 ± 0.09885	-32.8958 ± 6.57917
WELBY	01/14/97	12	6	-99 ± -99	0.00078 ± 0.00034	0.00135 ± 0.00049	0 ± 0.01044	0 ± 0.06108	0 ± 0.07864	-25.9765 ± 5.1953
WELBY	01/14/97	18	12	-99 ± -99	0.07681 ± 0.03378	0.00709 ± 0.00258	0 ± 0.01068	0 ± 0.05638	0 ± 0.05463	-35.0711 ± 7.01422

Table C.1A-5 (continued)
Contributions to Sulfur Dioxide at Core Sites for Individual Samples - NFRAQS Winter 1996/97, Extended Species CMB

Site ID	Date	Start Hour	Duration (hrs)	Sulfur Dioxide (µg/m^3)	R-square	Chi-square	Percent of Mass	Incremental cold start ("puffers")	Hot stabilized, non-smoking	Smoking LDGV exhaust	Diesel Exhaust
WELBY	01/15/97	06	6	1.30735 ± 5.00171	0.94173	0.33316	99.2222	0.21584 ± 0.2313	0.95495 ± 0.72685	0.50141 ± 0.27993	0.49365 ± 0.36144
WELBY	01/15/97	12	6	0.43578 ± 5.00019	0.96084	0.18988	123.885	-0.25575 ± 0.27407	0.5839 ± 0.44443	0.5002 ± 0.27926	0.54122 ± 0.39626
WELBY	01/15/97	18	12	1.1885 ± 5.00141	0.94194	0.35036	112.472	0.72358 ± 0.77541	1.17213 ± 0.89216	0.08311 ± 0.0464	-0.10026 ± 0.0734
WELBY	01/16/97	06	6	7.84408 ± 5.06116	0.96029	0.21541	102.041	-0.11471 ± 0.12293	0.22266 ± 0.16948	0.61097 ± 0.3411	0.60588 ± 0.4436
WELBY	01/16/97	12	6	3.92204 ± 5.01536	0.95238	0.23834	100.645	-0.33079 ± 0.35449	0.20601 ± 0.1568	0.59313 ± 0.33114	0.44094 ± 0.32284
WELBY	01/16/97	18	12	3.56549 ± 5.0127	0.9608	0.23393	95.0494	-0.29622 ± 0.31744	0.10348 ± 0.07877	1.0953 ± 0.6115	1.80974 ± 1.32504
WELBY	01/17/97	06	6	9.15143 ± 5.08306	0.95678	0.31214	92.9989	2.02734 ± 2.17257	2.03845 ± 1.55155	1.20031 ± 0.67012	3.26256 ± 2.38875
WELBY	01/17/97	12	6	10.4588 ± 5.10821	0.97467	0.13371	100.367	0.80935 ± 0.86732	1.36846 ± 1.0416	0.29201 ± 0.16303	0.69024 ± 0.50538
WELBY	01/17/97	18	12	18.5406 ± 5.33268	0.92174	0.41368	90.7253	-0.55253 ± 0.59211	-0.40652 ± 0.30942	1.12194 ± 0.62637	1.99999 ± 1.46433
WELBY	01/18/97	06	6	14.8166 ± 5.21491	0.88225	0.71666	101.6	1.50796 ± 1.61598	3.2035 ± 2.43832	0.2653 ± 0.14812	0.7558 ± 0.55338
WELBY	01/18/97	12	6	17.8671 ± 5.30964	0.92851	0.44392	106.712	1.15324 ± 1.23585	2.3235 ± 1.76851	0.22052 ± 0.12311	1.17227 ± 0.8583
WELBY	01/18/97	18	12	4.99169 ± 5.02486	0.9265	0.40892	87.0254	2.43305 ± 2.60734	1.72758 ± 1.31493	-0.1366 ± 0.07626	0.14412 ± 0.10552
WELBY	01/19/97	06	6	6.10095 ± 5.03708	0.93111	0.398	109.711	0.9334 ± 1.00026	0.88815 ± 0.67601	0.53616 ± 0.29933	0.33037 ± 0.24189
WELBY	01/19/97	12	6	11.7661 ± 5.13658	0.8556	0.75814	161.401	0.30045 ± 0.32197	1.97002 ± 1.49946	0.6935 ± 0.38718	0.18053 ± 0.13218
WELBY	01/19/97	18	12	6.41788 ± 5.04102	0.93462	0.31834	97.0529	2.66409 ± 2.85493	1.50888 ± 1.14848	0.00294 ± 0.00164	0.55739 ± 0.4081
WELBY	01/20/97	06	6	38.7846 ± 6.32791	0.86794	0.62028	96.7564	3.19829 ± 3.42739	2.00864 ± 1.52886	0.19106 ± 0.10667	1.04981 ± 0.76864
WELBY	01/20/97	12	6	29.6332 ± 5.81216	0.91992	0.45569	120.114	0.63996 ± 0.68581	1.37302 ± 1.04506	0.52655 ± 0.29397	0.78592 ± 0.57543
WELBY	01/20/97	18	12	2.37699 ± 5.00565	0.91287	0.44615	145.254	2.1107 ± 2.2619	1.19315 ± 0.90816	-0.01088 ± 0.00608	0.42489 ± 0.3111
WELBY	01/27/97	06	6	6.10095 ± 5.03708	0.92769	0.38307	81.1228	2.2257 ± 2.38513	1.2618 ± 0.96041	0.06164 ± 0.03441	-0.31267 ± 0.22893
WELBY	01/27/97	12	6	4.35782 ± 5.01896	0.9747	0.13531	91.3311	0.11779 ± 0.12622	0.03618 ± 0.02754	0.34402 ± 0.19206	0.40902 ± 0.29947
WELBY	01/27/97	18	12	3.56549 ± 5.0127	0.94889	0.30045	98.213	0.72515 ± 0.77709	-0.28109 ± 0.21395	0.35548 ± 0.19846	0.64945 ± 0.47551
WELBY	01/28/97	06	6	23.5323 ± 5.52609	0.91079	0.418	89.1911	0.04522 ± 0.04846	0.12637 ± 0.09619	0.47825 ± 0.267	1.29682 ± 0.94949
WELBY	01/28/97	12	6	8.71565 ± 5.07539	0.95414	0.23169	78.7171	1.3206 ± 1.41519	0.65012 ± 0.49484	0.33288 ± 0.18584	1.1506 ± 0.84244
WELBY	01/28/97	18	12	11.1719 ± 5.12329	0.97067	0.1569	100.184	1.41232 ± 1.51349	0.32811 ± 0.24974	0.2619 ± 0.14622	0.29498 ± 0.21598
WELBY	01/29/97	06	6	2.61469 ± 5.00683	0.96425	0.21505	94.574	0.49973 ± 0.53553	0.44557 ± 0.33914	0.44301 ± 0.24733	0.88891 ± 0.65084
WELBY	01/29/97	12	6	3.48626 ± 5.01214	0.97446	0.12382	123.225	0.27513 ± 0.29484	-0.16984 ± 0.12927	0.29385 ± 0.16405	0.23865 ± 0.17474
WELBY	01/29/97	18	12	9.03258 ± 5.08093	0.93998	0.36747	87.8062	0.74737 ± 0.80091	0.222 ± 0.16897	0.20515 ± 0.11453	0.41217 ± 0.30178
WELBY	01/30/97	06	6	39.6562 ± 6.3817	0.78205	0.98648	105.349	2.93562 ± 3.1459	2.11189 ± 1.60745	-0.06883 ± 0.03843	1.35502 ± 0.9921
WELBY	01/30/97	12	6	10.8946 ± 5.11731	0.90064	0.34547	182.476	-0.00388 ± 0.00416	1.13049 ± 0.86046	0.38438 ± 0.2146	0.46109 ± 0.3376
WELBY	01/30/97	18	12	0 ± 5	0.87477	0.46159	169.321	0.01985 ± 0.02127	0.66307 ± 0.50469	0.16053 ± 0.08962	0.09094 ± 0.06659

Table C.1A-5 (continued)
Contributions to Sulfur Dioxide at Core Sites for Individual Samples - NFRAQS Winter 1996/97, Extended Species CMB

Site ID	Date	Start Hour	Duration (hrs)	Meat Cooking	Wood Combustion (Softwood)	Wood Combustion (Hardwood)	Paved Road Dust	Ammonium Sulfate	Ammonium Nitrate	Coal-Fired Powerplant
WELBY	01/15/97	06	6	0 ± 0.00991	-0.00014 ± 0.00006	0.00062 ± 0.00022	0 ± 0.00885	0 ± 0.01425	0 ± 0.01296	-1.45548 ± 0.2911
WELBY	01/15/97	12	6	-99 ± -99	0.0005 ± 0.00022	-0.00003 ± 0.00001	0 ± 0.00554	0 ± 0.01303	0 ± 0.01507	5.67188 ± 1.13438
WELBY	01/15/97	18	12	0 ± 0.00072	0.00217 ± 0.00095	0.00197 ± 0.00072	0 ± 0.00533	0 ± 0.01783	0 ± 0.01345	-2.47041 ± 0.49408
WELBY	01/16/97	06	6	0 ± 0.00948	-0.00012 ± 0.00005	0.00036 ± 0.00013	0 ± 0.01566	0 ± 0.02099	0 ± 0.02316	4.07443 ± 0.81489
WELBY	01/16/97	12	6	0 ± 0.00153	0.00108 ± 0.00047	-0.00039 ± 0.00014	0 ± 0.04052	0 ± 0.0179	0 ± 0.02435	18.0144 ± 3.60288
WELBY	01/16/97	18	12	0 ± 0.00206	-0.00074 ± 0.00033	-0.00056 ± 0.0002	0 ± 0.05134	0 ± 0.03344	0 ± 0.07266	-10.4708 ± 2.09415
WELBY	01/17/97	06	6	0 ± 0.02139	0.0022 ± 0.00097	0.02945 ± 0.0107	0 ± 0.05616	0 ± 0.06836	0 ± 0.13693	-1.86404 ± 0.37281
WELBY	01/17/97	12	6	0 ± 0.00632	0.00077 ± 0.00034	-0.00111 ± 0.0004	0 ± 0.02223	0 ± 0.02728	0 ± 0.11061	-21.144 ± 4.2288
WELBY	01/17/97	18	12	0 ± 0.00556	-0.00048 ± 0.00021	-0.00076 ± 0.00028	0 ± 0.0374	0 ± 0.02299	0 ± 0.08116	-25.9975 ± 5.19949
WELBY	01/18/97	06	6	0 ± 0.00962	0.0067 ± 0.00295	0.00171 ± 0.00062	0 ± 0.04652	0 ± 0.00665	0 ± 0.03582	-4.13263 ± 0.82653
WELBY	01/18/97	12	6	0 ± 0.01493	-0.00127 ± 0.00056	0.01824 ± 0.00663	0 ± 0.03562	0 ± 0.00746	0 ± 0.06403	-17.7958 ± 3.55915
WELBY	01/18/97	18	12	0 ± 0.01798	0.02226 ± 0.00979	0.03132 ± 0.01138	0 ± 0.00897	0 ± 0.00553	0 ± 0.03493	14.3102 ± 2.86203
WELBY	01/19/97	06	6	0 ± 0.00493	0.00402 ± 0.00177	-0.00013 ± 0.00005	0 ± 0.01826	0 ± 0.00593	0 ± 0.02133	26.434 ± 5.28679
WELBY	01/19/97	12	6	-99 ± -99	-0.00016 ± 0.00007	0.00161 ± 0.00059	0 ± 0.00905	0 ± 0.004	0 ± 0.01167	28.33 ± 5.66599
WELBY	01/19/97	18	12	0 ± 0.02598	0.0047 ± 0.00207	0.02537 ± 0.00922	0 ± 0.02058	0 ± 0.00359	0 ± 0.01455	6.1406 ± 1.22812
WELBY	01/20/97	06	6	0 ± 0.00081	0.00203 ± 0.00089	0.01272 ± 0.00462	0 ± 0.03429	0 ± 0.00513	0 ± 0.02233	78.6187 ± 15.7237
WELBY	01/20/97	12	6	-99 ± -99	0.00033 ± 0.00014	0.00056 ± 0.0002	0 ± 0.02293	0 ± 0.00522	0 ± 0.01697	42.2092 ± 8.44184
WELBY	01/20/97	18	12	-99 ± -99	-0.00045 ± 0.0002	0.01816 ± 0.0066	0 ± 0.0081	0 ± 0.00748	0 ± 0.02825	-11.4581 ± 2.29162
WELBY	01/27/97	06	6	-99 ± -99	0.00961 ± 0.00423	0.00256 ± 0.00093	0 ± 0.01826	0 ± 0.02569	0 ± 0.04953	-18.9558 ± 3.79115
WELBY	01/27/97	12	6	-99 ± -99	-0.00098 ± 0.00043	0.00043 ± 0.00016	0 ± 0.00548	0 ± 0.02012	0 ± 0.03415	-3.01221 ± 0.60244
WELBY	01/27/97	18	12	-99 ± -99	0.00386 ± 0.0017	0.00138 ± 0.0005	0 ± 0.0112	0 ± 0.02152	0 ± 0.04854	-27.3703 ± 5.47407
WELBY	01/28/97	06	6	-99 ± -99	-0.00215 ± 0.00095	0.00006 ± 0.00002	0 ± 0.08884	0 ± 0.00643	0 ± 0.02126	78.5859 ± 15.7172
WELBY	01/28/97	12	6	-99 ± -99	-0.0021 ± 0.00092	0.00041 ± 0.00015	0 ± 0.13032	0 ± 0.01201	0 ± 0.06097	45.4267 ± 9.08534
WELBY	01/28/97	18	12	-99 ± -99	-0.00013 ± 0.00006	0.0007 ± 0.00025	0 ± 0.04792	0 ± 0.01226	0 ± 0.03179	5.15018 ± 1.03004
WELBY	01/29/97	06	6	-99 ± -99	-0.0013 ± 0.00057	0.00073 ± 0.00027	0 ± 0.00877	0 ± 0.02005	0 ± 0.06303	9.04376 ± 1.80875
WELBY	01/29/97	12	6	-99 ± -99	-0.00075 ± 0.00033	-0.00003 ± 0.00001	0 ± 0.00971	0 ± 0.01752	0 ± 0.02695	7.22097 ± 1.44419
WELBY	01/29/97	18	12	0 ± 0.00089	0.00095 ± 0.00042	0.00014 ± 0.00005	0 ± 0.00856	0 ± 0.01095	0 ± 0.01361	12.6108 ± 2.52216
WELBY	01/30/97	06	6	0 ± 0.00789	0.00172 ± 0.00075	0.03009 ± 0.01093	0 ± 0.08257	0 ± 0.00693	0 ± 0.01564	60.2697 ± 12.0539
WELBY	01/30/97	12	6	0 ± 0.00627	-0.00006 ± 0.00003	0.0017 ± 0.00062	0 ± 0.01639	0 ± 0.00134	0 ± 0.00305	36.6815 ± 7.33629
WELBY	01/30/97	18	12	0 ± 0.00502	-0.00051 ± 0.00023	0.00074 ± 0.00027	0 ± 0.00464	0 ± 0.00176	0 ± 0.0009	3.12894 ± 0.62579

Table C.1A-6
Contributions to Oxides of Nitrogen at Core Sites for Individual Samples - NFRAQS Winter 1996/97, Extended Species CMB

Site ID	Date	Start Hour	Duration (hrs)	Oxides of Nitrogen (μg/m^3)	R-square	Chi-square	Percent of Mass	Incremental cold start ("puffers")	Hot stabilized, non-smoking	Smoking LDGV exhaust	Diesel Exhaust
BRIGHT	12/18/96	06	6	0.05624 ± 0.01147	0.94696	0.24884	107.156	-0.00515 ± 0.00753	0.00369 ± 0.00251	0.03015 ± 0.01921	0.03614 ± 0.03658
BRIGHT	12/18/96	12	6	0.01321 ± 0.01009	0.86814	0.4292	67.2689	-0.0016 ± 0.00234	0.00422 ± 0.00287	0.01493 ± 0.00951	0.00735 ± 0.00744
BRIGHT	12/18/96	18	12	0.06017 ± 0.01167	0.91877	0.55765	174.449	0.00276 ± 0.00403	0.00681 ± 0.00463	0.01977 ± 0.01259	0.04442 ± 0.04496
BRIGHT	12/19/96	06	6	0.07161 ± 0.0123	0.90093	0.71493	97.5913	0.01637 ± 0.02391	0.0213 ± 0.01447	0.03769 ± 0.02401	0.03461 ± 0.03503
BRIGHT	12/19/96	12	6	0.10257 ± 0.01433	0.95264	0.28973	87.797	0.02729 ± 0.03986	0.0346 ± 0.02351	0.03772 ± 0.02403	0.06665 ± 0.06746
BRIGHT	12/19/96	18	12	0.06969 ± 0.01219	0.95264	0.27804	97.5091	0.00666 ± 0.00972	0.01534 ± 0.01042	0.01044 ± 0.00665	0.02152 ± 0.02178
BRIGHT	12/20/96	06	6	0 ± 0.01	0.94627	0.1404	98.4816	-0.00723 ± 0.01055	0.00165 ± 0.00112	0.01634 ± 0.01041	0.03298 ± 0.03338
BRIGHT	12/25/96	06	6	0 ± 0.01	0.82737	0.3782	122.389	0.00032 ± 0.00047	0.00874 ± 0.00594	0.01317 ± 0.00839	0.00769 ± 0.00778
BRIGHT	12/25/96	12	6	0 ± 0.01	0.86192	0.49436	116.647	-0.00117 ± 0.00171	0.00467 ± 0.00317	0.01063 ± 0.00677	0.00264 ± 0.00267
BRIGHT	12/25/96	18	12	0 ± 0.01	0.90966	0.38346	111.531	0.00093 ± 0.00136	0.00024 ± 0.00016	0.00241 ± 0.00154	0.00594 ± 0.00601
BRIGHT	12/26/96	06	6	0 ± 0.01	0.95011	0.23806	85.5113	0.00175 ± 0.00256	0.00065 ± 0.00044	0.01327 ± 0.00845	0.01314 ± 0.0133
BRIGHT	12/26/96	12	6	0 ± 0.01	0.91168	0.4276	114.996	0.00337 ± 0.00493	0.00482 ± 0.00327	0.00072 ± 0.00046	0.00981 ± 0.00993
BRIGHT	12/26/96	18	12	0 ± 0.01	0.94882	0.26857	120.921	0.00398 ± 0.00581	0.00585 ± 0.00397	0.0049 ± 0.00312	0.01089 ± 0.01102
BRIGHT	12/30/96	06	6	0.04244 ± 0.01086	0.90027	0.34308	107.852	0.00151 ± 0.00221	0.02029 ± 0.01378	0.0051 ± 0.00325	0.02752 ± 0.02786
BRIGHT	12/30/96	12	6	0.039 ± 0.01073	0.8281	0.45871	97.5083	-0.00314 ± 0.00459	0.02153 ± 0.01462	0.00555 ± 0.00353	0.03036 ± 0.03073
BRIGHT	12/30/96	18	12	0.04246 ± 0.01086	0.91522	0.48103	109.215	0.00608 ± 0.00888	0.00773 ± 0.00525	0.00498 ± 0.00317	0.0219 ± 0.02217
BRIGHT	12/31/96	06	6	0.04482 ± 0.01096	0.95116	0.21564	108.314	-0.00833 ± 0.01217	0.00094 ± 0.00064	0.02856 ± 0.01819	0.06233 ± 0.06309
BRIGHT	12/31/96	12	6	0.05374 ± 0.01135	0.92289	0.39994	134.718	0.00162 ± 0.00237	0.00649 ± 0.00441	0.01314 ± 0.00837	0.04203 ± 0.04254
BRIGHT	12/31/96	18	12	0.05305 ± 0.01132	0.88751	0.5466	117.748	0.00909 ± 0.01328	0.00695 ± 0.00472	0.01161 ± 0.0074	0.02302 ± 0.02329
BRIGHT	01/01/97	06	6	0.03637 ± 0.01064	0.89792	0.39318	113.824	0.01289 ± 0.01882	0.00951 ± 0.00646	0.00693 ± 0.00442	-0.00202 ± 0.00204
BRIGHT	01/01/97	12	6	0.06723 ± 0.01205	0.87896	0.65062	134.745	0.00924 ± 0.0135	0.00429 ± 0.00291	0.02477 ± 0.01578	0.03795 ± 0.03841
BRIGHT	01/01/97	18	12	0.05962 ± 0.01164	0.92624	0.41979	127.122	0.00312 ± 0.00456	0.00732 ± 0.00497	0.01433 ± 0.00913	0.02175 ± 0.02201
BRIGHT	01/02/97	06	6	0.05489 ± 0.01141	0.90415	0.30344	110.666	0.00587 ± 0.00858	0.01467 ± 0.00997	0.01988 ± 0.01267	0.03691 ± 0.03735
BRIGHT	01/02/97	12	6	0.03014 ± 0.01044	0.88166	0.41006	142.416	-0.00217 ± 0.00318	0.01924 ± 0.01307	0.01904 ± 0.01213	0.02713 ± 0.02746
BRIGHT	01/02/97	18	12	0.04469 ± 0.01095	0.94117	0.30128	156.115	0.00988 ± 0.01444	0.00726 ± 0.00493	0.01216 ± 0.00775	0.02746 ± 0.02779
BRIGHT	01/06/97	06	6	0.01468 ± 0.01011	0.91285	0.28958	109.72	-99 ± -99	0.02573 ± 0.01748	0.00194 ± 0.00123	0.00362 ± 0.00367
BRIGHT	01/06/97	12	6	0.02595 ± 0.01033	0.97759	0.08534	110.339	-0.00587 ± 0.00857	0.00153 ± 0.00104	0.01345 ± 0.00857	0.0255 ± 0.02581
BRIGHT	01/06/97	18	12	0.05776 ± 0.01155	0.947	0.30669	96.1483	-0.001 ± 0.00146	0.00298 ± 0.00202	0.01521 ± 0.00969	0.03455 ± 0.03497
BRIGHT	01/07/97	06	6	0.07611 ± 0.01257	0.9656	0.15628	103.44	-0.01023 ± 0.01495	-0.00423 ± 0.00287	0.02744 ± 0.01748	0.06896 ± 0.0698
BRIGHT	01/07/97	12	6	0.07762 ± 0.01266	0.9621	0.19814	102.617	-0.0001 ± 0.00014	0.00521 ± 0.00354	0.02273 ± 0.01448	0.05742 ± 0.05812
BRIGHT	01/07/97	18	12	0.02111 ± 0.01022	0.95963	0.20596	107.482	0.00102 ± 0.00149	0.00922 ± 0.00626	0.00534 ± 0.0034	0.00669 ± 0.00677
BRIGHT	01/08/97	06	6	0.06137 ± 0.01173	0.97186	0.13964	93.4303	0.01676 ± 0.02448	0.00173 ± 0.00118	0.0221 ± 0.01408	0.04139 ± 0.04189
BRIGHT	01/12/97	06	6	0.00394 ± 0.01001	0.8585	0.32911	59.4525	-0.00278 ± 0.00406	0.00293 ± 0.00199	0.00517 ± 0.00329	0.00433 ± 0.00438
BRIGHT	01/12/97	12	6	0.00811 ± 0.01003	0.9147	0.2786	83.8301	-0.0031 ± 0.00453	0.00267 ± 0.00181	0.00795 ± 0.00506	0.00596 ± 0.00603
BRIGHT	01/12/97	18	12	0.03312 ± 0.01053	0.88073	0.6962	91.9326	-0.00057 ± 0.00083	0.00056 ± 0.00038	0.02073 ± 0.01321	0.02443 ± 0.02473

Table C.1A-6 (continued)
Contributions to Oxides of Nitrogen at Core Sites for Individual Samples - NFRAQS Winter 1996/97, Extended Species CMB

Site ID	Date	Start Hour	Duration (hrs)	Meat Cooking	Wood Combustion (Softwood)	Wood Combustion (Hardwood)	Paved Road Dust	Ammonium Sulfate	Ammonium Nitrate	Coal-Fired Powerplant
BRIGHT	12/18/96	06	6	0 ± 0.00001	0 ± 0	0 ± 0	0 ± 0.00001	0 ± 0.00001	0 ± 0.00002	0.00195 ± 0.00039
BRIGHT	12/18/96	12	6	0 ± 0	0 ± 0	-0.00001 ± 0	0 ± 0.00001	0 ± 0.00001	0 ± 0.00001	0.03768 ± 0.00754
BRIGHT	12/18/96	18	12	-99 ± -99	0.00001 ± 0.00001	0.00001 ± 0	0 ± 0	0 ± 0.00001	0 ± 0.00002	-0.00944 ± 0.00189
BRIGHT	12/19/96	06	6	0 ± 0	0.00008 ± 0.00004	0.00002 ± 0.00001	0 ± 0.00001	0 ± 0.00002	0 ± 0.00004	-0.01243 ± 0.00249
BRIGHT	12/19/96	12	6	-99 ± -99	0.00002 ± 0.00001	0.00009 ± 0.00003	0 ± 0.00002	0 ± 0.00003	0 ± 0.00011	-0.03134 ± 0.00627
BRIGHT	12/19/96	18	12	-99 ± -99	0.00001 ± 0	0 ± 0	0 ± 0	0 ± 0.00001	0 ± 0.00002	-0.01174 ± 0.00235
BRIGHT	12/20/96	06	6	-99 ± -99	0 ± 0	0 ± 0	0 ± 0.00001	0 ± 0	0 ± 0.00001	0.00731 ± 0.00146
BRIGHT	12/25/96	06	6	0 ± 0	0.00001 ± 0.00001	0 ± 0	0 ± 0.00001	0 ± 0	0 ± 0	0.0071 ± 0.00142
BRIGHT	12/25/96	12	6	0 ± 0	0 ± 0	0 ± 0	0 ± 0.00001	0 ± 0	0 ± 0.00001	0.01362 ± 0.00272
BRIGHT	12/25/96	18	12	-99 ± -99	0 ± 0	0.00001 ± 0	0 ± 0	0 ± 0.00003	0 ± 0.00006	-0.00441 ± 0.00088
BRIGHT	12/26/96	06	6	-99 ± -99	0.00001 ± 0	-0.00001 ± 0	0 ± 0.00001	0 ± 0.00003	0 ± 0.00007	0.00993 ± 0.00199
BRIGHT	12/26/96	12	6	0 ± 0.00001	0.00001 ± 0	0.00003 ± 0.00001	0 ± 0.00002	0 ± 0.00003	0 ± 0.00006	0.01166 ± 0.00233
BRIGHT	12/26/96	18	12	-99 ± -99	0 ± 0	0 ± 0	0 ± 0.00001	0 ± 0.00002	0 ± 0.00004	0.01123 ± 0.00225
BRIGHT	12/30/96	06	6	0 ± 0.00001	0 ± 0	0.00006 ± 0.00002	0 ± 0.00001	0 ± 0	0 ± 0	0.02408 ± 0.00482
BRIGHT	12/30/96	12	6	0 ± 0	-0.00001 ± 0	0.00005 ± 0.00002	0 ± 0.00002	0 ± 0	0 ± 0	0.01232 ± 0.00246
BRIGHT	12/30/96	18	12	0 ± 0	0.00002 ± 0.00001	0.00006 ± 0.00002	0 ± 0.00001	0 ± 0.00001	0 ± 0.00001	0.00691 ± 0.00138
BRIGHT	12/31/96	06	6	0 ± 0	0 ± 0	0 ± 0	0 ± 0.00002	0 ± 0.00001	0 ± 0.00003	0.01109 ± 0.00222
BRIGHT	12/31/96	12	6	-99 ± -99	0 ± 0	0 ± 0	0 ± 0.00002	0 ± 0.00001	0 ± 0.00003	0.0327 ± 0.00654
BRIGHT	12/31/96	18	12	-99 ± -99	0.00001 ± 0	0 ± 0	0 ± 0.00001	0 ± 0	0 ± 0	0.01089 ± 0.00218
BRIGHT	01/01/97	06	6	-99 ± -99	-99 ± -99	0.00002 ± 0.00001	0 ± 0.00001	0 ± 0	0 ± 0.00001	-0.00587 ± 0.00117
BRIGHT	01/01/97	12	6	-99 ± -99	-0.00001 ± 0	0 ± 0	0 ± 0.00004	0 ± 0.00001	0 ± 0.00007	-0.0173 ± 0.00346
BRIGHT	01/01/97	18	12	0 ± 0	0 ± 0	0 ± 0	0 ± 0.00002	0 ± 0	0 ± 0.00001	0.00518 ± 0.00104
BRIGHT	01/02/97	06	6	0 ± 0	0 ± 0	0.00002 ± 0.00001	0 ± 0.00003	0 ± 0	0 ± 0	0.02497 ± 0.00499
BRIGHT	01/02/97	12	6	-99 ± -99	0 ± 0	0 ± 0	0 ± 0.00003	0 ± 0	0 ± 0	0.00344 ± 0.00069
BRIGHT	01/02/97	18	12	0 ± 0	0 ± 0	0 ± 0	0 ± 0.00002	0 ± 0.00001	0 ± 0.00001	0.00332 ± 0.00066
BRIGHT	01/06/97	06	6	-99 ± -99	0.00006 ± 0.00003	0.00003 ± 0.00001	0 ± 0	0 ± 0	0 ± 0.00002	0.00297 ± 0.00059
BRIGHT	01/06/97	12	6	0 ± 0	0 ± 0	0 ± 0	0 ± 0	0 ± 0.00001	0 ± 0.00004	-0.00009 ± 0.00002
BRIGHT	01/06/97	18	12	0 ± 0	0 ± 0	0.00001 ± 0	0 ± 0	0 ± 0.00001	0 ± 0.00003	-0.00358 ± 0.00072
BRIGHT	01/07/97	06	6	-99 ± -99	0 ± 0	0 ± 0	0 ± 0.00002	0 ± 0.00001	0 ± 0.00004	0.00189 ± 0.00038
BRIGHT	01/07/97	12	6	0 ± 0.00001	-0.00001 ± 0	0.00001 ± 0	0 ± 0.00003	0 ± 0.00001	0 ± 0.00007	0.01969 ± 0.00394
BRIGHT	01/07/97	18	12	-99 ± -99	0 ± 0	0.00001 ± 0	0 ± 0.00001	0 ± 0.00001	0 ± 0.00002	-0.00014 ± 0.00003
BRIGHT	01/08/97	06	6	-99 ± -99	0 ± 0	0 ± 0	0 ± 0.00001	0 ± 0.00002	0 ± 0.00008	0.00961 ± 0.00192
BRIGHT	01/12/97	06	6	0 ± 0	0 ± 0	0 ± 0	0 ± 0	0 ± 0.00001	0 ± 0	-0.0031 ± 0.00062
BRIGHT	01/12/97	12	6	-99 ± -99	0.00001 ± 0	0 ± 0	0 ± 0	0 ± 0.00001	0 ± 0.00001	0.00567 ± 0.00113
BRIGHT	01/12/97	18	12	-99 ± -99	0 ± 0	0.00002 ± 0.00001	0 ± 0.00002	0 ± 0.00002	0 ± 0.00004	0.01098 ± 0.0022

Table C.1A-6 (continued)
Contributions to Oxides of Nitrogen at Core Sites for Individual Samples - NFRAQS Winter 1996/97, Extended Species CMB

Site ID	Date	Start Hour	Duration (hrs)	Oxides of Nitrogen (µg/m^3)	R-square	Chi-square	Percent of Mass	Incremental cold start ("puffers")	Hot stabilized, non-smoking	Smoking LDGV exhaust	Diesel Exhaust
BRIGHT	01/13/97	06	6	0.03055 ± 0.01046	0.96715	0.16167	104.478	-0.00565 ± 0.00825	-0.00008 ± 0.00006	0.03008 ± 0.01916	0.03214 ± 0.03253
BRIGHT	01/13/97	12	6	0.04278 ± 0.01088	0.96866	0.1359	83.0781	-0.01077 ± 0.01573	-0.00278 ± 0.00189	0.03441 ± 0.02192	0.03253 ± 0.03293
BRIGHT	01/13/97	18	12	0.08918 ± 0.0134	0.95778	0.25771	90.2663	0.00077 ± 0.00112	0.00463 ± 0.00315	0.03261 ± 0.02078	0.04669 ± 0.04726
BRIGHT	01/14/97	06	6	0.16284 ± 0.01911	0.95196	0.28788	91.2966	0.01579 ± 0.02307	-0.00295 ± 0.00201	0.04793 ± 0.03053	0.0472 ± 0.04778
BRIGHT	01/14/97	12	6	0.06288 ± 0.01181	0.96109	0.19749	69.8811	-0.00514 ± 0.0075	0.01341 ± 0.00911	0.02598 ± 0.01655	0.01951 ± 0.01974
BRIGHT	01/14/97	18	12	0.11973 ± 0.0156	0.95692	0.28384	97.1516	0.00819 ± 0.01197	0.0094 ± 0.00638	0.02966 ± 0.01889	0.03655 ± 0.037
BRIGHT	01/15/97	06	6	0.05235 ± 0.01129	0.95308	0.22366	62.4223	-0.00694 ± 0.01014	0.01094 ± 0.00743	0.01956 ± 0.01246	0.01965 ± 0.01989
BRIGHT	01/15/97	12	6	0.02005 ± 0.0102	0.94333	0.28034	116.239	0.00048 ± 0.0007	0.00694 ± 0.00472	0.0083 ± 0.00528	0.01037 ± 0.0105
BRIGHT	01/15/97	18	12	0.01251 ± 0.01008	0.96899	0.13518	98.3563	-0.00597 ± 0.00873	0.00512 ± 0.00348	0.01011 ± 0.00644	0.00701 ± 0.0071
BRIGHT	01/16/97	06	6	0.0564 ± 0.01148	0.95821	0.20078	91.6799	-0.00525 ± 0.00767	0.00587 ± 0.00399	0.01564 ± 0.00996	0.0284 ± 0.02874
BRIGHT	01/16/97	12	6	0.02397 ± 0.01028	0.96945	0.13287	92.5676	-0.00844 ± 0.01233	-0.0003 ± 0.0002	0.02142 ± 0.01364	0.01864 ± 0.01887
BRIGHT	01/16/97	18	12	0.12319 ± 0.01587	0.91445	0.58308	89.7666	0.00226 ± 0.0033	-0.00173 ± 0.00117	0.02464 ± 0.0157	0.04401 ± 0.04455
BRIGHT	01/17/97	06	6	0.25429 ± 0.02733	0.93106	0.44455	95.7647	0.01438 ± 0.021	0.00907 ± 0.00616	0.0474 ± 0.03019	0.08763 ± 0.08869
BRIGHT	01/17/97	12	6	0.12738 ± 0.01619	0.95877	0.23938	97.3321	0.02362 ± 0.0345	0.01078 ± 0.00733	0.01341 ± 0.00854	0.05279 ± 0.05344
BRIGHT	01/17/97	18	12	0.27597 ± 0.02935	0.93145	0.40475	88.3774	0.01546 ± 0.02258	0.00138 ± 0.00094	0.02473 ± 0.01575	0.06927 ± 0.07011
BRIGHT	01/18/97	06	6	0.0969 ± 0.01392	0.92153	0.37625	141.516	0.01444 ± 0.0211	0.01451 ± 0.00985	0.021 ± 0.01338	0.03751 ± 0.03796
BRIGHT	01/18/97	12	6	0.08811 ± 0.01333	0.94237	0.24048	113.987	0.02009 ± 0.02934	0.00183 ± 0.00124	0.0119 ± 0.00758	0.02333 ± 0.02361
BRIGHT	01/18/97	18	12	0.11344 ± 0.01512	0.92797	0.40816	101.699	0.0061 ± 0.0089	0.0008 ± 0.00054	0.01669 ± 0.01063	0.02672 ± 0.02704
BRIGHT	01/19/97	06	6	0.09095 ± 0.01352	0.93331	0.25646	157.052	-0.00667 ± 0.00974	0.00545 ± 0.0037	0.01962 ± 0.0125	0.02607 ± 0.02638
BRIGHT	01/19/97	12	6	0.05637 ± 0.01148	0.86155	0.43767	104.965	-0.00314 ± 0.00458	0.00062 ± 0.00042	0.02765 ± 0.01761	0.01672 ± 0.01693
BRIGHT	01/19/97	18	12	0.14059 ± 0.01725	0.96338	0.21055	90.0162	0.02181 ± 0.03186	0.00849 ± 0.00577	0.02321 ± 0.01478	0.03277 ± 0.03317
BRIGHT	01/20/97	06	6	0.15783 ± 0.01868	0.904	0.4892	93.451	0.00156 ± 0.00228	0.02284 ± 0.01552	0.0288 ± 0.01834	0.058 ± 0.0587
BRIGHT	01/20/97	12	6	0.09054 ± 0.01349	0.90779	0.43139	128.735	-0.00309 ± 0.00452	0.00905 ± 0.00615	0.0203 ± 0.01293	0.07165 ± 0.07252
BRIGHT	01/27/97	06	6	0.01108 ± 0.01006	0.96685	0.13429	89.2059	-0.00209 ± 0.00305	-0.00256 ± 0.00174	0.00884 ± 0.00563	0.01079 ± 0.01092
BRIGHT	01/27/97	12	6	0 ± 0.01	0.92615	0.27244	94.4204	0.00537 ± 0.00784	-0.00124 ± 0.00084	-0.00089 ± 0.00057	0.00508 ± 0.00514
BRIGHT	01/27/97	18	12	0 ± 0.01	0.93919	0.35318	99.0156	0.01439 ± 0.02102	-0.00026 ± 0.00017	0.01506 ± 0.0096	0.02828 ± 0.02862
BRIGHT	01/28/97	12	6	0.18925 ± 0.02141	0.94523	0.28944	76.6791	0.03003 ± 0.04387	-0.00599 ± 0.00407	0.02031 ± 0.01294	0.04225 ± 0.04277
BRIGHT	01/28/97	18	12	0.02732 ± 0.01037	0.91035	0.48349	86.72	0.00259 ± 0.00378	0.00764 ± 0.00519	0.00399 ± 0.00254	0.00644 ± 0.00652
BRIGHT	01/29/97	06	6	0.03386 ± 0.01056	0.95747	0.19574	102.231	0.0335 ± 0.04893	-0.00764 ± 0.00519	0.00346 ± 0.0022	-0.0107 ± 0.01083
BRIGHT	01/29/97	12	6	0.02501 ± 0.01031	0.92903	0.33933	114.113	0.01241 ± 0.01812	0.0073 ± 0.00496	0.00173 ± 0.0011	0.00497 ± 0.00503
BRIGHT	01/29/97	18	12	0.04871 ± 0.01112	0.95258	0.23933	104.998	-0.00083 ± 0.00121	0.0005 ± 0.00034	0.01096 ± 0.00698	0.02236 ± 0.02263
BRIGHT	01/30/97	06	6	0.15358 ± 0.01833	0.90171	0.48854	124.391	0.00697 ± 0.01019	0.00561 ± 0.00381	0.02973 ± 0.01894	0.04032 ± 0.04081
BRIGHT	01/30/97	12	6	0.04072 ± 0.0108	0.87866	0.24076	125.023	-0.00338 ± 0.00494	0.00725 ± 0.00492	0.01448 ± 0.00922	0.00973 ± 0.00985
BRIGHT	01/30/97	18	12	0.02531 ± 0.01032	0.89778	0.33437	155.019	-0.00017 ± 0.00025	0.0039 ± 0.00265	0.00872 ± 0.00555	0.01418 ± 0.01435

Table C.1A-6 (continued)
Contributions to Oxides of Nitrogen at Core Sites for Individual Samples - NFRAQS Winter 1996/97, Extended Species CMB

Site ID	Date	Start Hour	Duration (hrs)	Meat Cooking	Wood Combustion (Softwood)	Wood Combustion (Hardwood)	Paved Road Dust	Ammonium Sulfate	Ammonium Nitrate	Coal-Fired Powerplant
BRIGHT	01/13/97	06	6	-99 ± -99	0 ± 0	0.00001 ± 0	0 ± 0.00001	0 ± 0.00002	0 ± 0.00006	0.02373 ± 0.00475
BRIGHT	01/13/97	12	6	-99 ± -99	0 ± 0	0.00001 ± 0	0 ± 0.00001	0 ± 0.00003	0 ± 0.00008	-0.00824 ± 0.00165
BRIGHT	01/13/97	18	12	-99 ± -99	0 ± 0	0.00003 ± 0.00001	0 ± 0.00001	0 ± 0.00003	0 ± 0.0001	-0.01071 ± 0.00214
BRIGHT	01/14/97	06	6	0 ± 0	0.00001 ± 0	0.00011 ± 0.00004	0 ± 0.00002	0 ± 0.00005	0 ± 0.00012	0.00071 ± 0.00014
BRIGHT	01/14/97	12	6	0 ± 0	0.00001 ± 0.00001	0 ± 0	0 ± 0	0 ± 0.00003	0 ± 0.00005	-0.01229 ± 0.00246
BRIGHT	01/14/97	18	12	0 ± 0	0.00002 ± 0.00001	0.00002 ± 0.00001	0 ± 0.00001	0 ± 0.00005	0 ± 0.00005	-0.02395 ± 0.00479
BRIGHT	01/15/97	06	6	0 ± 0	0 ± 0	0.00001 ± 0	0 ± 0.00001	0 ± 0.00002	0 ± 0.00002	0.01052 ± 0.0021
BRIGHT	01/15/97	12	6	0 ± 0	0.00001 ± 0	0 ± 0	0 ± 0	0 ± 0.00002	0 ± 0.00002	0.00479 ± 0.00096
BRIGHT	01/15/97	18	12	0 ± 0	0 ± 0	0 ± 0	0 ± 0.00001	0 ± 0.00002	0 ± 0.00001	0.01187 ± 0.00237
BRIGHT	01/16/97	06	6	-99 ± -99	0 ± 0	0 ± 0	0 ± 0.00001	0 ± 0.00002	0 ± 0.00002	0.03311 ± 0.00662
BRIGHT	01/16/97	12	6	0 ± 0	0.00001 ± 0	0.00001 ± 0	0 ± 0.00001	0 ± 0.00002	0 ± 0.00002	0.00011 ± 0.00002
BRIGHT	01/16/97	18	12	-99 ± -99	0.00003 ± 0.00001	0.00002 ± 0.00001	0 ± 0.00002	0 ± 0.00003	0 ± 0.00006	0.01992 ± 0.00398
BRIGHT	01/17/97	06	6	-99 ± -99	0.00001 ± 0.00001	0.00006 ± 0.00002	0 ± 0.00002	0 ± 0.00005	0 ± 0.00012	-0.00528 ± 0.00106
BRIGHT	01/17/97	12	6	0 ± 0.00002	0.00006 ± 0.00003	0.00003 ± 0.00001	0 ± 0.00001	0 ± 0.00004	0 ± 0.00017	-0.00682 ± 0.00136
BRIGHT	01/17/97	18	12	-99 ± -99	0 ± 0	0.00003 ± 0.00001	0 ± 0.00003	0 ± 0.00003	0 ± 0.00009	-0.03029 ± 0.00606
BRIGHT	01/18/97	06	6	-99 ± -99	0.00001 ± 0	0.00002 ± 0.00001	0 ± 0.00001	0 ± 0	0 ± 0.00002	-0.00567 ± 0.00113
BRIGHT	01/18/97	12	6	-99 ± -99	0 ± 0	0.00002 ± 0.00001	0 ± 0.00001	0 ± 0	0 ± 0.00003	0.00863 ± 0.00173
BRIGHT	01/18/97	18	12	-99 ± -99	0.00003 ± 0.00001	0.00002 ± 0.00001	0 ± 0.00001	0 ± 0.00001	0 ± 0.00004	-0.00976 ± 0.00195
BRIGHT	01/19/97	06	6	-99 ± -99	0.00001 ± 0	0.00001 ± 0	0 ± 0	0 ± 0	0 ± 0.00003	0.01885 ± 0.00377
BRIGHT	01/19/97	12	6	0 ± 0	0 ± 0	0 ± 0	0 ± 0.00001	0 ± 0	0 ± 0.00001	0.00985 ± 0.00197
BRIGHT	01/19/97	18	12	0 ± 0	0 ± 0	0.00005 ± 0.00002	0 ± 0.00001	0 ± 0.00002	0 ± 0.00012	-0.01531 ± 0.00306
BRIGHT	01/20/97	06	6	-99 ± -99	0 ± 0	0.00003 ± 0.00001	0 ± 0.00003	0 ± 0	0 ± 0.00002	0.03198 ± 0.0064
BRIGHT	01/20/97	12	6	-99 ± -99	0.00001 ± 0	0.00002 ± 0.00001	0 ± 0.00001	0 ± 0	0 ± 0.00004	0.03478 ± 0.00696
BRIGHT	01/27/97	06	6	0 ± 0	0 ± 0	0 ± 0	0 ± 0	0 ± 0.00002	0 ± 0.00004	-0.0088 ± 0.00176
BRIGHT	01/27/97	12	6	0 ± 0.00001	0 ± 0	0 ± 0	0 ± 0	0 ± 0.00001	0 ± 0.00001	0.00696 ± 0.00139
BRIGHT	01/27/97	18	12	-99 ± -99	0 ± 0	0.00002 ± 0.00001	0 ± 0.00001	0 ± 0.00002	0 ± 0.00004	-0.01757 ± 0.00351
BRIGHT	01/28/97	12	6	-99 ± -99	0 ± 0	0.00005 ± 0.00002	0 ± 0.00002	0 ± 0.00003	0 ± 0.00011	-0.01245 ± 0.00249
BRIGHT	01/28/97	18	12	0 ± 0	0 ± 0	0.00001 ± 0	0 ± 0	0 ± 0.00001	0 ± 0.00002	0.00137 ± 0.00027
BRIGHT	01/29/97	06	6	0 ± 0.00002	0 ± 0	0 ± 0	0 ± 0.00001	0 ± 0.00001	0 ± 0.00003	0.01667 ± 0.00333
BRIGHT	01/29/97	12	6	0 ± 0.00001	0 ± 0	-0.00001 ± 0	0 ± 0	0 ± 0.00001	0 ± 0.00002	-0.0036 ± 0.00072
BRIGHT	01/29/97	18	12	-99 ± -99	0 ± 0	0 ± 0	0 ± 0	0 ± 0.00001	0 ± 0.00001	0.0075 ± 0.0015
BRIGHT	01/30/97	06	6	0 ± 0	0 ± 0	0 ± 0	0 ± 0.00002	0 ± 0	0 ± 0.00001	0.04084 ± 0.00817
BRIGHT	01/30/97	12	6	-99 ± -99	0 ± 0	0 ± 0	0 ± 0.00001	0 ± 0	0 ± 0	0.02241 ± 0.00448
BRIGHT	01/30/97	18	12	-99 ± -99	0 ± 0	0 ± 0	0 ± 0	0 ± 0	0 ± 0	0.01046 ± 0.00209

Table C.1A-6 (continued)
Contributions to Oxides of Nitrogen at Core Sites for Individual Samples - NFRAQS Winter 1996/97, Extended Species CMB

Site ID	Date	Start Hour	Duration (hrs)	Oxides of Nitrogen (µg/m^3)	R-square	Chi-square	Percent of Mass	Incremental cold start ("puffers")	Hot stabilized, non-smoking	Smoking LDGV exhaust	Diesel Exhaust	Site ID
WELBY	12/18/96	12	6	0 ± 0.01	0.90377	0.4508	107.705	-0.00146 ± 0.00213	0.02559 ± 0.01738	0.01182 ± 0.00753	0.01819 ± 0.01841	WELBY
WELBY	12/19/96	06	6	0 ± 0.01	0.927	0.49731	112.131	0.00992 ± 0.01449	0.07224 ± 0.04908	0.03703 ± 0.02359	0.06585 ± 0.06665	WELBY
WELBY	12/19/96	12	6	0 ± 0.01	0.93103	0.42077	94.2949	0.02711 ± 0.0396	0.05436 ± 0.03692	0.03287 ± 0.02094	0.07478 ± 0.07569	WELBY
WELBY	12/19/96	18	12	0 ± 0.01	0.87751	0.8296	98.3231	0.04367 ± 0.06379	0.06355 ± 0.04317	-0.00588 ± 0.00375	0.04378 ± 0.04431	WELBY
WELBY	12/20/96	06	6	0 ± 0.01	0.89281	0.57922	107.337	0.09962 ± 0.14552	0.08941 ± 0.06074	-0.00898 ± 0.00572	0.06158 ± 0.06233	WELBY
WELBY	12/25/96	06	6	0 ± 0.01	0.93949	0.28542	105.787	0.00033 ± 0.00048	0.01107 ± 0.00752	0.01767 ± 0.01126	0.02623 ± 0.02655	WELBY
WELBY	12/25/96	12	6	0 ± 0.01	0.86983	0.39052	123.483	-0.00193 ± 0.00281	0.01075 ± 0.0073	0.01594 ± 0.01015	0.00711 ± 0.0072	WELBY
WELBY	12/25/96	18	12	0 ± 0.01	0.96283	0.1544	91.588	-0.00305 ± 0.00446	0.00105 ± 0.00072	0.00661 ± 0.00421	0.01054 ± 0.01067	WELBY
WELBY	12/30/96	06	6	0 ± 0.01	0.82721	0.7915	135.081	0.02503 ± 0.03657	0.0607 ± 0.04123	0.00666 ± 0.00424	0.03658 ± 0.03703	WELBY
WELBY	12/30/96	12	6	0 ± 0.01	0.89613	0.48401	115.822	0.04183 ± 0.0611	0.02986 ± 0.02029	0.011 ± 0.007	0.08321 ± 0.08422	WELBY
WELBY	12/30/96	18	12	0 ± 0.01	0.93275	0.40653	102.551	0.04084 ± 0.05966	0.01605 ± 0.0109	0.02255 ± 0.01437	0.06532 ± 0.06612	WELBY
WELBY	12/31/96	06	6	0 ± 0.01	0.92342	0.38811	103.39	-0.00686 ± 0.01002	0.00651 ± 0.00442	0.03077 ± 0.0196	0.13014 ± 0.13172	WELBY
WELBY	12/31/96	12	6	0 ± 0.01	0.86193	0.65173	122.643	0.04338 ± 0.06337	0.0232 ± 0.01576	0.01503 ± 0.00958	0.02981 ± 0.03017	WELBY
WELBY	12/31/96	18	12	0.44471 ± 0.04558	0.84326	0.98928	102.979	0.06313 ± 0.09222	0.00907 ± 0.00616	-99 ± -99	0.05073 ± 0.05134	WELBY
WELBY	01/01/97	06	6	0.15661 ± 0.01858	0.80837	0.87535	116.785	0.06748 ± 0.09857	0.05809 ± 0.03946	-99 ± -99	-0.01793 ± 0.01814	WELBY
WELBY	01/01/97	12	6	0.29795 ± 0.03143	0.91336	0.48448	110.43	0.06231 ± 0.09102	0.06199 ± 0.04211	0.00224 ± 0.00143	0.02078 ± 0.02103	WELBY
WELBY	01/01/97	18	12	0.3602 ± 0.03738	0.86078	1.07183	111.064	-99 ± -99	0.07334 ± 0.04982	0.00258 ± 0.00164	0.05471 ± 0.05538	WELBY
WELBY	01/02/97	06	6	0.53706 ± 0.05463	0.94831	0.30692	109.491	0.10466 ± 0.15288	0.07902 ± 0.05368	-99 ± -99	0.14768 ± 0.14948	WELBY
WELBY	01/02/97	12	6	0.1593 ± 0.01881	0.91639	0.45934	111.9	0.01184 ± 0.01729	0.03853 ± 0.02617	0.01542 ± 0.00982	0.06095 ± 0.06169	WELBY
WELBY	01/02/97	18	12	0.33511 ± 0.03497	0.92603	0.43418	103.929	0.05359 ± 0.07829	0.05095 ± 0.03461	-99 ± -99	0.05686 ± 0.05756	WELBY
WELBY	01/06/97	06	6	0.07543 ± 0.01253	0.9035	0.44255	97.7999	0.01697 ± 0.02479	0.00713 ± 0.00484	-99 ± -99	0.00539 ± 0.00546	WELBY
WELBY	01/06/97	12	6	0.09702 ± 0.01393	0.93675	0.30957	83.4631	0.02929 ± 0.04278	0.01105 ± 0.00751	-0.01014 ± 0.00646	0.01015 ± 0.01028	WELBY
WELBY	01/06/97	18	12	0.23149 ± 0.02522	0.91765	0.56058	98.0311	0.0002 ± 0.00029	0.00395 ± 0.00268	0.01983 ± 0.01263	0.05787 ± 0.05857	WELBY
WELBY	01/07/97	06	6	0.33582 ± 0.03504	0.89877	0.59799	94.7872	0.08419 ± 0.12298	0.07202 ± 0.04892	0.01409 ± 0.00897	0.05074 ± 0.05136	WELBY
WELBY	01/07/97	12	6	0.1506 ± 0.01808	0.90564	0.53508	98.332	0.0083 ± 0.01212	0.01587 ± 0.01078	0.0202 ± 0.01287	0.05042 ± 0.05104	WELBY
WELBY	01/07/97	18	12	0.11387 ± 0.01515	0.95372	0.26338	84.4171	0.03503 ± 0.05117	0.04476 ± 0.03041	0.00592 ± 0.00377	0.00189 ± 0.00192	WELBY
WELBY	01/08/97	06	6	0.33864 ± 0.03531	0.92051	0.48359	129.5	0.08639 ± 0.1262	0.05458 ± 0.03708	0.01147 ± 0.0073	0.06979 ± 0.07064	WELBY
WELBY	01/12/97	06	6	0.01627 ± 0.01013	0.89251	0.43755	103.997	0.02119 ± 0.03096	0.04347 ± 0.02953	-99 ± -99	0.0027 ± 0.00273	WELBY
WELBY	01/12/97	12	6	0.01534 ± 0.01012	0.90861	0.41414	89.8276	0.01843 ± 0.02692	0.01998 ± 0.01357	-0.00028 ± 0.00018	-0.00209 ± 0.00212	WELBY
WELBY	01/12/97	18	12	0.0396 ± 0.01076	0.89666	0.68482	99.207	0.02086 ± 0.03047	0.0096 ± 0.00652	0.01891 ± 0.01204	0.01695 ± 0.01716	WELBY
WELBY	01/13/97	06	6	0.0338 ± 0.01056	0.96316	0.19794	94.5547	0.00676 ± 0.00988	0.01319 ± 0.00896	0.03354 ± 0.02137	0.01749 ± 0.0177	WELBY
WELBY	01/13/97	12	6	0.07399 ± 0.01244	0.97159	0.14584	88.7075	-0.00911 ± 0.0133	-0.00222 ± 0.00151	0.02751 ± 0.01753	0.04879 ± 0.04938	WELBY
WELBY	01/13/97	18	12	0.11267 ± 0.01507	0.96819	0.19145	90.2272	0.01533 ± 0.02239	0.00733 ± 0.00498	0.03183 ± 0.02028	0.02751 ± 0.02785	WELBY
WELBY	01/14/97	12	6	0.1399 ± 0.0172	0.97175	0.18661	96.2249	0.02136 ± 0.03121	0.01719 ± 0.01168	0.0374 ± 0.02382	0.05062 ± 0.05124	WELBY
WELBY	01/14/97	18	12	0.197 ± 0.02209	0.92315	0.47248	100.198	0.01938 ± 0.02831	0.00945 ± 0.00642	0.01481 ± 0.00943	0.02556 ± 0.02587	WELBY

Table C.1A-6 (continued)
Contributions to Oxides of Nitrogen at Core Sites for Individual Samples - NFRAQS Winter 1996/97, Extended Species CMB

Date	Start Hour	Duration (hrs)	Meat Cooking	Wood Combustion (Softwood)	Wood Combustion (Hardwood)	Paved Road Dust	Ammonium Sulfate	Ammonium Nitrate	Coal-Fired Powerplant
12/18/96	12	6	0 ± 0	0.00002 ± 0.00001	0 ± 0	0 ± 0.00001	0 ± 0.00001	0 ± 0.00001	0.01662 ± 0.00332
12/19/96	06	6	-99 ± -99	0.00009 ± 0.00004	0.00003 ± 0.00001	0 ± 0.00003	0 ± 0.00002	0 ± 0.00004	0.01088 ± 0.00218
12/19/96	12	6	-99 ± -99	0.00001 ± 0	0.00001 ± 0	0 ± 0.00003	0 ± 0.00003	0 ± 0.0001	-0.04365 ± 0.00873
12/19/96	18	12	0 ± 0.00002	0.00001 ± 0	0.00004 ± 0.00001	0 ± 0.00002	0 ± 0.00002	0 ± 0.00003	-0.01903 ± 0.00381
12/20/96	06	6	0 ± 0	0.00003 ± 0.00001	0.00029 ± 0.0001	0 ± 0.00004	0 ± 0.00001	0 ± 0.00002	-0.0219 ± 0.00438
12/25/96	06	6	0 ± 0	0.00001 ± 0	0 ± 0	0 ± 0.00001	0 ± 0.00001	0 ± 0.00001	0.02271 ± 0.00454
12/25/96	12	6	-99 ± -99	0.00001 ± 0.00001	-0.00001 ± 0.00001	0 ± 0.00001	0 ± 0	0 ± 0.00001	0.0085 ± 0.0017
12/25/96	18	12	-99 ± -99	0.00001 ± 0.00001	0 ± 0	0 ± 0.00001	0 ± 0.00002	0 ± 0.00005	-0.0035 ± 0.0007
12/30/96	06	6	0 ± 0	0.00004 ± 0.00002	0.00006 ± 0.00002	0 ± 0.00002	0 ± 0	0 ± 0.00001	0.03129 ± 0.00626
12/30/96	12	6	-99 ± -99	0 ± 0	0.00009 ± 0.00003	0 ± 0.00005	0 ± 0.00001	0 ± 0.00001	0.03977 ± 0.00795
12/30/96	18	12	-99 ± -99	0.00005 ± 0.00002	0.00004 ± 0.00002	0 ± 0.00003	0 ± 0.00001	0 ± 0.00001	-0.00518 ± 0.00104
12/31/96	06	6	-99 ± -99	0.00002 ± 0.00001	0.00003 ± 0.00001	0 ± 0.00005	0 ± 0.00001	0 ± 0.00004	0.07736 ± 0.01547
12/31/96	12	6	-99 ± -99	0.00001 ± 0	0.00009 ± 0.00003	0 ± 0.00003	0 ± 0.00001	0 ± 0.00001	0.02638 ± 0.00528
12/31/96	18	12	0 ± 0.00001	0.0001 ± 0.00004	0.00048 ± 0.00017	0 ± 0.00002	0 ± 0.00001	0 ± 0.00001	0.10035 ± 0.02007
01/01/97	06	6	-99 ± -99	0.00009 ± 0.00004	0.00016 ± 0.00006	0 ± 0.00001	0 ± 0	0 ± 0.00001	0.04887 ± 0.00977
01/01/97	12	6	0 ± 0.00001	-0.00001 ± 0	0.00013 ± 0.00005	0 ± 0.00003	0 ± 0.00001	0 ± 0.00006	0.01495 ± 0.00299
01/01/97	18	12	-99 ± -99	0.00026 ± 0.00011	0.00053 ± 0.00019	0 ± 0.00002	0 ± 0.00001	0 ± 0.00001	0.01365 ± 0.00273
01/02/97	06	6	0 ± 0.00001	0.00008 ± 0.00003	0.00018 ± 0.00007	0 ± 0.00007	0 ± 0.00002	0 ± 0.00003	0.08128 ± 0.01626
01/02/97	12	6	0 ± 0.00001	0.00001 ± 0	0.00003 ± 0.00001	0 ± 0.00005	0 ± 0.00001	0 ± 0.00001	0.05198 ± 0.0104
01/02/97	18	12	0 ± 0.00001	0.00007 ± 0.00003	0.00002 ± 0.00001	0 ± 0.00002	0 ± 0.00001	0 ± 0.00001	0.02668 ± 0.00534
01/06/97	06	6	0 ± 0.00001	0.00009 ± 0.00004	-0.00002 ± 0.00001	0 ± 0	0 ± 0.00001	0 ± 0.00003	-0.00821 ± 0.00164
01/06/97	12	6	0 ± 0.00002	0.00004 ± 0.00002	0 ± 0	0 ± 0.00003	0 ± 0.00002	0 ± 0.00005	-0.0363 ± 0.00726
01/06/97	18	12	0 ± 0.00001	0 ± 0	0 ± 0	0 ± 0.00003	0 ± 0.00001	0 ± 0.00002	0.00317 ± 0.00063
01/07/97	06	6	-99 ± -99	0.00012 ± 0.00005	0.00011 ± 0.00004	0 ± 0.00011	0 ± 0.00001	0 ± 0.00003	0.00622 ± 0.00124
01/07/97	12	6	-99 ± -99	0 ± 0	0.00001 ± 0	0 ± 0.00009	0 ± 0.00001	0 ± 0.00006	-0.00839 ± 0.00168
01/07/97	18	12	0 ± 0	0.00001 ± 0	0.00001 ± 0	0 ± 0.00003	0 ± 0.00001	0 ± 0.00003	-0.01129 ± 0.00226
01/08/97	06	6	-99 ± -99	0.00001 ± 0	0.00015 ± 0.00005	0 ± 0.00003	0 ± 0.00002	0 ± 0.00009	-0.00083 ± 0.00017
01/12/97	06	6	-99 ± -99	0.00002 ± 0.00001	0.00002 ± 0.00001	0 ± 0	0 ± 0.00001	0 ± 0.00001	-0.00196 ± 0.00039
01/12/97	12	6	-99 ± -99	0.00003 ± 0.00001	0.00001 ± 0	0 ± 0	0 ± 0.00001	0 ± 0.00001	-0.01808 ± 0.00362
01/12/97	18	12	-99 ± -99	0.00001 ± 0.00001	0 ± 0	0 ± 0.00001	0 ± 0.00001	0 ± 0.00004	-0.02478 ± 0.00496
01/13/97	06	6	0 ± 0.00001	0 ± 0	0 ± 0	0 ± 0.00001	0 ± 0.00002	0 ± 0.00005	-0.0131 ± 0.00262
01/13/97	12	6	0 ± 0.00001	0.00002 ± 0.00001	0 ± 0	0 ± 0.00001	0 ± 0.00004	0 ± 0.0001	-0.0112 ± 0.00224
01/13/97	18	12	-99 ± -99	0.00008 ± 0.00003	0 ± 0	0 ± 0.00001	0 ± 0.00003	0 ± 0.0001	-0.03457 ± 0.00691
01/14/97	12	6	-99 ± -99	0.00001 ± 0	0.00001 ± 0	0 ± 0.00001	0 ± 0.00006	0 ± 0.00008	-0.0273 ± 0.00546
01/14/97	18	12	-99 ± -99	0.0005 ± 0.00022	0.00005 ± 0.00002	0 ± 0.00001	0 ± 0.00006	0 ± 0.00005	-0.03686 ± 0.00737

Table C.1A-6 (continued)
Contributions to Oxides of Nitrogen at Core Sites for Individual Samples - NFRAQS Winter 1996/97, Extended Species CMB

Site ID	Date	Start Hour	Duration (hrs)	Oxides of Nitrogen (µg/m^3)	R-square	Chi-square	Percent of Mass	Incremental cold start ("puffers")	Hot stabilized, non-smoking	Smoking LDGV exhaust	Diesel Exhaust	Site ID
WELBY	01/15/97	06	6	0.08075 ± 0.01285	0.94173	0.33316	99.2222	0.00719 ± 0.0105	0.02235 ± 0.01518	0.025 ± 0.01593	0.02818 ± 0.02853	WELBY
WELBY	01/15/97	12	6	0.04507 ± 0.01097	0.96084	0.18988	123.885	-0.00852 ± 0.01245	0.01367 ± 0.00928	0.02494 ± 0.01589	0.0309 ± 0.03127	WELBY
WELBY	01/15/97	18	12	0.035 ± 0.0106	0.94194	0.35036	112.472	0.0241 ± 0.03521	0.02744 ± 0.01864	0.00414 ± 0.00264	-0.00572 ± 0.00579	WELBY
WELBY	01/16/97	06	6	0.07418 ± 0.01245	0.96029	0.21541	102.041	-0.00382 ± 0.00558	0.00521 ± 0.00354	0.03046 ± 0.0194	0.03459 ± 0.03501	WELBY
WELBY	01/16/97	12	6	0.03317 ± 0.01054	0.95238	0.23834	100.645	-0.01102 ± 0.0161	0.00482 ± 0.00328	0.02957 ± 0.01884	0.02517 ± 0.02548	WELBY
WELBY	01/16/97	18	12	0.29294 ± 0.03095	0.9608	0.23393	95.0494	-0.00987 ± 0.01441	0.00242 ± 0.00165	0.05461 ± 0.03479	0.10332 ± 0.10458	WELBY
WELBY	01/17/97	06	6	0.60373 ± 0.0612	0.95678	0.31214	92.9989	0.06754 ± 0.09865	0.04771 ± 0.03241	0.05985 ± 0.03812	0.18627 ± 0.18853	WELBY
WELBY	01/17/97	12	6	0.13896 ± 0.01712	0.97467	0.13371	100.367	0.02696 ± 0.03938	0.03203 ± 0.02176	0.01456 ± 0.00927	0.03941 ± 0.03989	WELBY
WELBY	01/17/97	18	12	0.43481 ± 0.04462	0.92174	0.41368	90.7253	-0.01841 ± 0.02689	-0.00952 ± 0.00646	0.05594 ± 0.03563	0.11418 ± 0.11557	WELBY
WELBY	01/18/97	06	6	0.26728 ± 0.02854	0.88225	0.71666	101.6	0.05023 ± 0.07338	0.07498 ± 0.05094	0.01323 ± 0.00843	0.04315 ± 0.04367	WELBY
WELBY	01/18/97	12	6	0.29357 ± 0.03101	0.92851	0.44392	106.712	0.03842 ± 0.05612	0.05438 ± 0.03694	0.01099 ± 0.007	0.06693 ± 0.06774	WELBY
WELBY	01/18/97	18	12	0.37796 ± 0.0391	0.9265	0.40892	87.0254	0.08105 ± 0.1184	0.04044 ± 0.02747	-0.00681 ± 0.00434	0.00823 ± 0.00833	WELBY
WELBY	01/19/97	06	6	0.27761 ± 0.02951	0.93111	0.398	109.711	0.03109 ± 0.04542	0.02079 ± 0.01412	0.02673 ± 0.01703	0.01886 ± 0.01909	WELBY
WELBY	01/19/97	12	6	0.09233 ± 0.01361	0.8556	0.75814	161.401	0.01001 ± 0.01462	0.04611 ± 0.03132	0.03458 ± 0.02203	0.01031 ± 0.01043	WELBY
WELBY	01/19/97	18	12	0.5613 ± 0.05701	0.93462	0.31834	97.0529	0.08875 ± 0.12964	0.03532 ± 0.02399	0.00015 ± 0.00009	0.03182 ± 0.03221	WELBY
WELBY	01/20/97	06	6	0.51453 ± 0.05241	0.86794	0.62028	96.7564	0.10654 ± 0.15563	0.04702 ± 0.03194	0.00953 ± 0.00607	0.05994 ± 0.06066	WELBY
WELBY	01/20/97	12	6	0.14616 ± 0.01771	0.91992	0.45569	120.114	0.02132 ± 0.03114	0.03214 ± 0.02183	0.02625 ± 0.01672	0.04487 ± 0.04542	WELBY
WELBY	01/20/97	18	12	0.22756 ± 0.02486	0.91287	0.44615	145.254	0.07031 ± 0.10271	0.02793 ± 0.01897	-0.00054 ± 0.00035	0.02426 ± 0.02455	WELBY
WELBY	01/27/97	06	6	0.09765 ± 0.01398	0.92769	0.38307	81.1228	0.07414 ± 0.10831	0.02953 ± 0.02006	0.00307 ± 0.00196	-0.01785 ± 0.01807	WELBY
WELBY	01/27/97	12	6	0.06541 ± 0.01195	0.9747	0.13531	91.3311	0.00392 ± 0.00573	0.00085 ± 0.00058	0.01715 ± 0.01093	0.02335 ± 0.02364	WELBY
WELBY	01/27/97	18	12	0.20946 ± 0.02321	0.94889	0.30045	98.213	0.02416 ± 0.03529	-0.00658 ± 0.00447	0.01772 ± 0.01129	0.03708 ± 0.03753	WELBY
WELBY	01/28/97	06	6	0.45162 ± 0.04626	0.91079	0.418	89.1911	0.00151 ± 0.0022	0.00296 ± 0.00201	0.02385 ± 0.01519	0.07404 ± 0.07494	WELBY
WELBY	01/28/97	12	6	0.27323 ± 0.02909	0.95414	0.23169	78.7171	0.04399 ± 0.06426	0.01522 ± 0.01034	0.0166 ± 0.01057	0.06569 ± 0.06649	WELBY
WELBY	01/28/97	18	12	0.20571 ± 0.02287	0.97067	0.1569	100.184	0.04705 ± 0.06873	0.00768 ± 0.00522	0.01306 ± 0.00832	0.01684 ± 0.01705	WELBY
WELBY	01/29/97	06	6	0.15836 ± 0.01873	0.96425	0.21505	94.574	0.01665 ± 0.02432	0.01043 ± 0.00708	0.02209 ± 0.01407	0.05075 ± 0.05137	WELBY
WELBY	01/29/97	12	6	0.05665 ± 0.01149	0.97446	0.12382	123.225	0.00917 ± 0.01339	-0.00398 ± 0.0027	0.01465 ± 0.00933	0.01363 ± 0.01379	WELBY
WELBY	01/29/97	18	12	0.20639 ± 0.02293	0.93998	0.36747	87.8062	0.0249 ± 0.03637	0.0052 ± 0.00353	0.01023 ± 0.00652	0.02353 ± 0.02382	WELBY
WELBY	01/30/97	06	6	0.48855 ± 0.04987	0.78205	0.98648	105.349	0.09779 ± 0.14285	0.04943 ± 0.03358	-0.00343 ± 0.00219	0.07736 ± 0.0783	WELBY
WELBY	01/30/97	12	6	0.06729 ± 0.01205	0.90064	0.34547	182.476	-0.00013 ± 0.00019	0.02646 ± 0.01798	0.01916 ± 0.01221	0.02632 ± 0.02664	WELBY
WELBY	01/30/97	18	12	0.02305 ± 0.01026	0.87477	0.46159	169.321	0.00066 ± 0.00097	0.01552 ± 0.01054	0.008 ± 0.0051	0.00519 ± 0.00526	WELBY

Table C.1A-6 (continued)
Contributions to Oxides of Nitrogen at Core Sites for Individual Samples - NFRAQS Winter 1996/97, Extended Species CMB

Date	Start Hour	Duration (hrs)	Meat Cooking	Wood Combustion (Softwood)	Wood Combustion (Hardwood)	Paved Road Dust	Ammonium Sulfate	Ammonium Nitrate	Coal-Fired Powerplant
01/15/97	06	6	0 ± 0.00001	0 ± 0	0 ± 0	0 ± 0.00001	0 ± 0.00001	0 ± 0.00001	-0.00153 ± 0.00031
01/15/97	12	6	-99 ± -99	0 ± 0	0 ± 0	0 ± 0.00001	0 ± 0.00001	0 ± 0.00002	0.00596 ± 0.00119
01/15/97	18	12	0 ± 0	0.00001 ± 0.00001	0.00001 ± 0	0 ± 0.00001	0 ± 0.00002	0 ± 0.00001	-0.0026 ± 0.00052
01/16/97	06	6	0 ± 0.00001	0 ± 0	0 ± 0	0 ± 0.00002	0 ± 0.00002	0 ± 0.00002	0.00428 ± 0.00086
01/16/97	12	6	0 ± 0	0.00001 ± 0	0 ± 0	0 ± 0.00004	0 ± 0.00002	0 ± 0.00002	0.01893 ± 0.00379
01/16/97	18	12	0 ± 0	0 ± 0	0 ± 0	0 ± 0.00005	0 ± 0.00003	0 ± 0.00007	-0.011 ± 0.0022
01/17/97	06	6	0 ± 0.00002	0.00001 ± 0.00001	0.00021 ± 0.00007	0 ± 0.00006	0 ± 0.00007	0 ± 0.00014	-0.00196 ± 0.00039
01/17/97	12	6	0 ± 0.00001	0 ± 0	-0.00001 ± 0	0 ± 0.00002	0 ± 0.00003	0 ± 0.00011	-0.02222 ± 0.00444
01/17/97	18	12	0 ± 0.00001	0 ± 0	-0.00001 ± 0	0 ± 0.00004	0 ± 0.00002	0 ± 0.00008	-0.02732 ± 0.00546
01/18/97	06	6	0 ± 0.00001	0.00004 ± 0.00002	0.00001 ± 0	0 ± 0.00005	0 ± 0.00001	0 ± 0.00004	-0.00434 ± 0.00087
01/18/97	12	6	0 ± 0.00001	-0.00001 ± 0	0.00013 ± 0.00005	0 ± 0.00004	0 ± 0.00001	0 ± 0.00006	-0.0187 ± 0.00374
01/18/97	18	12	0 ± 0.00002	0.00014 ± 0.00006	0.00022 ± 0.00008	0 ± 0.00001	0 ± 0.00001	0 ± 0.00003	0.01504 ± 0.00301
01/19/97	06	6	0 ± 0	0.00003 ± 0.00001	0 ± 0	0 ± 0.00002	0 ± 0.00001	0 ± 0.00002	0.02778 ± 0.00556
01/19/97	12	6	-99 ± -99	0 ± 0	0.00001 ± 0	0 ± 0.00001	0 ± 0	0 ± 0.00001	0.02977 ± 0.00595
01/19/97	18	12	0 ± 0.00003	0.00003 ± 0.00001	0.00018 ± 0.00006	0 ± 0.00002	0 ± 0	0 ± 0.00001	0.00645 ± 0.00129
01/20/97	06	6	0 ± 0	0.00001 ± 0.00001	0.00009 ± 0.00003	0 ± 0.00003	0 ± 0.00001	0 ± 0.00002	0.08262 ± 0.01653
01/20/97	12	6	-99 ± -99	0 ± 0	0 ± 0	0 ± 0.00002	0 ± 0.00001	0 ± 0.00002	0.04436 ± 0.00887
01/20/97	18	12	-99 ± -99	0 ± 0	0.00013 ± 0.00005	0 ± 0.00001	0 ± 0.00001	0 ± 0.00003	-0.01204 ± 0.00241
01/27/97	06	6	-99 ± -99	0.00006 ± 0.00003	0.00002 ± 0.00001	0 ± 0.00002	0 ± 0.00003	0 ± 0.00005	-0.01992 ± 0.00398
01/27/97	12	6	-99 ± -99	-0.00001 ± 0	0 ± 0	0 ± 0.00001	0 ± 0.00002	0 ± 0.00003	-0.00317 ± 0.00063
01/27/97	18	12	-99 ± -99	0.00003 ± 0.00001	0.00001 ± 0	0 ± 0.00001	0 ± 0.00002	0 ± 0.00005	-0.02877 ± 0.00575
01/28/97	06	6	-99 ± -99	-0.00001 ± 0.00001	0 ± 0	0 ± 0.00009	0 ± 0.00001	0 ± 0.00002	0.08259 ± 0.01652
01/28/97	12	6	-99 ± -99	-0.00001 ± 0.00001	0 ± 0	0 ± 0.00013	0 ± 0.00001	0 ± 0.00006	0.04774 ± 0.00955
01/28/97	18	12	-99 ± -99	0 ± 0	0 ± 0	0 ± 0.00005	0 ± 0.00001	0 ± 0.00003	0.00541 ± 0.00108
01/29/97	06	6	-99 ± -99	-0.00001 ± 0	0.00001 ± 0	0 ± 0.00001	0 ± 0.00002	0 ± 0.00006	0.0095 ± 0.0019
01/29/97	12	6	-99 ± -99	0 ± 0	0 ± 0	0 ± 0.00001	0 ± 0.00002	0 ± 0.00003	0.00759 ± 0.00152
01/29/97	18	12	0 ± 0	0.00001 ± 0	0 ± 0	0 ± 0.00001	0 ± 0.00001	0 ± 0.00001	0.01325 ± 0.00265
01/30/97	06	6	0 ± 0.00001	0.00001 ± 0	0.00021 ± 0.00008	0 ± 0.00008	0 ± 0.00001	0 ± 0.00002	0.06334 ± 0.01267
01/30/97	12	6	0 ± 0.00001	0 ± 0	0.00001 ± 0	0 ± 0.00002	0 ± 0	0 ± 0	0.03855 ± 0.00771
01/30/97	18	12	0 ± 0.00001	0 ± 0	0.00001 ± 0	0 ± 0	0 ± 0	0 ± 0	0.00329 ± 0.00066

APPENDIX C.1B

Contributions to $PM_{2.5}$ Mass and Carbon at Core and Satellite Sites for Individual Samples – NFRAQS Winter 1996/97, Conventional CMB

Table C.1B-1
24-Hour Contributions to Total Carbon at Core and Satellite Sites for Individual Samples - NFRAQS Winter 1996/97, Conventional CMB

Site ID	Sample Date	Start Hour	Duration (hrs)	Size	Total Carbon (μg/m^3)	R-square	Chi-square	Percent of Mass	Light-Duty Gasoline Vehicle Exhaust	Diesel Exhaust Diesel Exhaust	Paved Road Dust	Meat Cooking and Wood Combustion	Ammonium Sulfate	Ammonium Nitrate	Coal-Fired Power Plant
BRIGHT	12/18/96	06	24	F	3.41695 ± 0.27846	0.9918	0.1219	117.659	1.87801 ± 0.08378	0.29999 ± 0.06273	1.19411 ± 0.04733	0.05904 ± 0.01878	0 ± 0.00015	0 ± 0.00019	0.00956 ± 0.00952
BRIGHT	12/19/96	06	24	F	5.3504 ± 0.3563	0.98882	0.14971	92.21834	2.91326 ± 0.12997	0.77596 ± 0.16225	1.65266 ± 0.0655	0.06376 ± 0.02028	0 ± 0.00024	0 ± 0.00064	±
BRIGHT	12/25/96	06	24	F	0.87203 ± 0.2537	0.98823	0.13271	110.0184	0.04681 ± 0.00209	0.66905 ± 0.1399	0.14362 ± 0.00569	0.04068 ± 0.01294	0 ± 0.00021	0 ± 0.0005	0.00686 ± 0.00683
BRIGHT	12/26/96	06	24	F	1.61825 ± 0.24332	0.98415	0.22945	105.0126	0.0688 ± 0.00307	1.01054 ± 0.2113	0.45346 ± 0.01797	0.10747 ± 0.03419	0 ± 0.00032	0 ± 0.00071	0.01327 ± 0.01321
BRIGHT	12/30/96	06	24	F	2.3254 ± 0.26209	0.96654	0.31062	107.8098	0.89431 ± 0.0399	0.40019 ± 0.08368	0.97813 ± 0.03877	0.09354 ± 0.02976	0 ± 0.00007	0 ± 0.00006	0.01607 ± 0.016
BRIGHT	12/31/96	06	24	F	3.6349 ± 0.27941	0.95806	0.54679	118.4375	1.13219 ± 0.05051	1.05041 ± 0.21964	1.42665 ± 0.05655	0.09908 ± 0.03152	0 ± 0.00007	0 ± 0.00022	0.02458 ± 0.02447
BRIGHT	01/02/97	06	24	F	3.44642 ± 0.27468	0.97534	0.22823	135.4146	0.80374 ± 0.03586	1.24488 ± 0.2603	1.23865 ± 0.0491	0.19544 ± 0.06217	0 ± 0.00006	0 ± 0.00011	0.01283 ± 0.01277
BRIGHT	01/06/97	06	24	F	2.24412 ± 0.26103	0.98876	0.15218	102.2595	0.96789 ± 0.04318	0.39955 ± 0.08354	0.87507 ± 0.03468	0.01509 ± 0.0048	0 ± 0.00011	0 ± 0.00039	0.00585 ± 0.00582
BRIGHT	01/07/97	06	24	F	3.12057 ± 0.27818	0.98856	0.17359	106.4701	1.49046 ± 0.06649	0.33535 ± 0.07012	1.18083 ± 0.0468	0.1526 ± 0.04854	0 ± 0.00013	0 ± 0.00054	0.00689 ± 0.00686
BRIGHT	01/12/97	06	24	F	2.09238 ± 0.26912	0.955	0.60683	85.98517	0.87908 ± 0.03922	0.81535 ± 0.17049	0.41136 ± 0.0163	0.05492 ± 0.01747	0 ± 0.00016	0 ± 0.00033	0.02417 ± 0.02407
BRIGHT	01/13/97	06	24	F	5.22013 ± 0.33303	0.98847	0.19441	91.7846	2.95377 ± 0.13178	1.1442 ± 0.23925	1.08867 ± 0.04315	0.05384 ± 0.01713	0 ± 0.00041	0 ± 0.00125	0.01429 ± 0.01423
BRIGHT	01/14/97	06	24	F	5.52968 ± 0.35034	0.98902	0.18011	89.94721	3.44098 ± 0.15351	0.79115 ± 0.16543	1.27455 ± 0.05052	0.04182 ± 0.0133	0 ± 0.00061	0 ± 0.00096	±
BRIGHT	01/15/97	06	24	F	1.66885 ± 0.24368	0.9852	0.2198	85.70633	0.94221 ± 0.04204	0.45997 ± 0.09618	0.23653 ± 0.00937	0.0508 ± 0.01616	0 ± 0.00025	0 ± 0.00023	0.01156 ± 0.01151
BRIGHT	01/16/97	06	24	F	3.86227 ± 0.28714	0.97924	0.37286	90.97844	2.07223 ± 0.09245	0.66521 ± 0.1391	1.07519 ± 0.04262	0.07228 ± 0.02299	0 ± 0.00031	0 ± 0.00058	0.02224 ± 0.02215
BRIGHT	01/17/97	06	24	F	7.50945 ± 0.40876	0.97421	0.44112	94.03374	3.97131 ± 0.17717	0.58958 ± 0.12328	2.83137 ± 0.11222	0.18174 ± 0.05781	0 ± 0.00049	0 ± 0.00163	±
BRIGHT	01/18/97	06	24	F	3.91587 ± 0.29054	0.98944	0.14858	116.6143	2.10621 ± 0.09397	0.43075 ± 0.09007	1.38099 ± 0.05474	0.04013 ± 0.01277	0 ± 0.00006	0 ± 0.00045	0.00323 ± 0.00322
BRIGHT	01/19/97	06	24	F	4.25445 ± 0.30421	0.98722	0.18982	98.87736	2.67705 ± 0.11943	0.49246 ± 0.10297	1.10448 ± 0.04378	0.04727 ± 0.01504	0 ± 0.00013	0 ± 0.00097	0.00276 ± 0.00275
BRIGHT	01/27/97	06	24	F	2.44592 ± 0.26886	0.98881	0.17027	96.1968	0.97612 ± 0.04355	0.74604 ± 0.156	0.7719 ± 0.03059	0.024 ± 0.00764	0 ± 0.00021	0 ± 0.00049	0.00644 ± 0.00642
BRIGHT	01/29/97	06	24	F	2.31787 ± 0.26492	0.98755	0.17522	107.8725	1.45151 ± 0.06476	0.31445 ± 0.06575	0.50637 ± 0.02007	0.02239 ± 0.00712	0 ± 0.00016	0 ± 0.00025	0.00669 ± 0.00666
BRIGHT	01/30/97	06	24	F	2.7336 ± 0.28443	0.94924	0.38334	142.3274	1.69819 ± 0.07576	0.3091 ± 0.06463	0.70865 ± 0.02809	0.04521 ± 0.01438	0 ± 0.00003	0 ± 0.00008	0.01628 ± 0.01621
LONGMO	12/18/96	06	24	F	3.7556 ± 0.4393	0.98962	0.17894	93.68561	1.39881 ± 0.06241	0.92096 ± 0.19257	1.36211 ± 0.05399	0.13706 ± 0.0436	0 ± 0.00016	0 ± 0.00027	0.01074 ± 0.01069
LONGMO	12/19/96	06	24	F	4.7431 ± 0.4801	0.9759	0.44234	98.54799	2.40306 ± 0.10721	0.8651 ± 0.18089	1.47267 ± 0.05837	0.08116 ± 0.02582	0 ± 0.00017	0 ± 0.00064	0.03071 ± 0.03058
LONGMO	12/25/96	06	24	F	0.8263 ± 0.3776	0.95974	0.6003	77.26418	0.1143 ± 0.0051	0.64941 ± 0.13579	0.04443 ± 0.00176	0.07177 ± 0.02283	0 ± 0.00012	0 ± 0.00048	0.01204 ± 0.01199
LONGMO	12/26/96	06	24	F	1.9249 ± 0.3991	0.98376	0.25537	98.24805	±	1.11493 ± 0.23313	0.51705 ± 0.02049	0.35572 ± 0.11316	0 ± 0.00045	0 ± 0.00086	0.0116 ± 0.01155
LONGMO	01/06/97	06	24	F	3.2174 ± 0.4006	0.98952	0.16828	113.6065	1.80792 ± 0.08066	0.66354 ± 0.13875	0.72186 ± 0.02861	0.02622 ± 0.00834	0 ± 0.0001	0 ± 0.00045	0.01834 ± 0.01826
LONGMO	01/07/97	06	24	F	2.2346 ± 0.3802	0.96592	0.46705	115.7217	±	1.14434 ± 0.23928	0.80978 ± 0.0321	0.3264 ± 0.10383	0 ± 0.00007	0 ± 0.00034	0.02275 ± 0.02266
LONGMO	01/13/97	06	24	F	4.3162 ± 0.4521	0.98743	0.1954	96.19735	1.87495 ± 0.08365	1.27891 ± 0.26742	1.13436 ± 0.04496	0.02574 ± 0.00819	0 ± 0.00032	0 ± 0.00106	0.01958 ± 0.01949
LONGMO	01/14/97	06	24	F	6.6312 ± 0.5818	0.99211	0.14891	94.56229	3.81478 ± 0.17019	1.49157 ± 0.31189	1.23173 ± 0.04882	0.06606 ± 0.02102	0 ± 0.0008	0 ± 0.00198	0.02195 ± 0.02186
LONGMO	01/15/97	06	24	F	2.423 ± 0.3714	0.98202	0.30986	107.7938	1.06196 ± 0.04738	0.48455 ± 0.10132	0.87128 ± 0.03453	0.04857 ± 0.01545	0 ± 0.00027	0 ± 0.00037	0.0089 ± 0.00886
LONGMO	01/16/97	06	24	F	5.3356 ± 0.5024	0.9899	0.17696	80.86354	2.92503 ± 0.1305	1.08436 ± 0.22674	1.23313 ± 0.04888	0.08967 ± 0.02853	0 ± 0.00045	0 ± 0.00103	0.02296 ± 0.02287
LONGMO	01/17/97	06	24	F	7.1929 ± 0.6081	0.99048	0.17535	93.60557	3.82199 ± 0.17051	1.22619 ± 0.2564	2.08431 ± 0.08261	0.07784 ± 0.02476	0 ± 0.00043	0 ± 0.00232	0.04452 ± 0.04433
LONGMO	01/18/97	06	24	F	4.9782 ± 0.4824	0.99117	0.14914	92.57707	2.6661 ± 0.11894	0.99955 ± 0.20901	1.29697 ± 0.05141	0.07335 ± 0.02333	0 ± 0.00014	0 ± 0.00134	0.00673 ± 0.0067
LONGMO	01/19/97	06	24	F	4.5917 ± 0.4648	0.98951	0.17283	120.5118	3.07305 ± 0.1371	0.70852 ± 0.14815	0.80124 ± 0.03176	0.06562 ± 0.02087	0 ± 0.00011	0 ± 0.0016	0.00069 ± 0.00069
LONGMO	01/20/97	06	24	F	4.8561 ± 0.475	0.98845	0.18996	110.6792	1.94908 ± 0.08696	0.28253 ± 0.05908	2.59655 ± 0.10292	0.08349 ± 0.02656	0 ± 0.00009	0 ± 0.00074	0.01017 ± 0.01013
LONGMO	01/27/97	06	24	F	2.2022 ± 0.3662	0.97735	0.36595	88.72358	0.84826 ± 0.03784	0.73946 ± 0.15462	0.66757 ± 0.02646	0.03071 ± 0.00977	0 ± 0.00026	0 ± 0.00076	0.00832 ± 0.00828
LONGMO	01/28/97	06	24	F	5.4816 ± 0.5099	0.98397	0.26647	88.54654	2.39271 ± 0.10675	0.37804 ± 0.07905	2.69248 ± 0.10672	0.10699 ± 0.03404	0 ± 0.0004	0 ± 0.00113	0.0069 ± 0.00687
LONGMO	01/29/97	06	24	F	3.0413 ± 0.3972	0.98115	0.31904	93.4498	1.88 ± 0.08387	0.27722 ± 0.05797	0.91994 ± 0.03646	0.03286 ± 0.01045	0 ± 0.00025	0 ± 0.0007	0.00903 ± 0.00899
LONGMO	01/30/97	06	24	F	2.5171 ± 0.3995	0.97226	0.4463	47.59289	1.0989 ± 0.04903	0.36233 ± 0.07576	1.04015 ± 0.04123	0.06837 ± 0.02175	0 ± 0.00011	0 ± 0.00071	0.02732 ± 0.0272
FTCOLL	12/18/96	06	24	F	3.09 ± 0.4073	0.92663	1.02211	110.0238	0.94685 ± 0.04224	0.89007 ± 0.18611	0.51327 ± 0.02034	0.74944 ± 0.23841	0 ± 0.00011	0 ± 0.00015	0.03482 ± 0.03467
FTCOLL	12/19/96	06	24	F	6.1317 ± 0.5485	0.97275	0.48621	99.85317	2.55871 ± 0.11415	1.15182 ± 0.24085	2.13338 ± 0.08456	0.36188 ± 0.11512	0 ± 0.00016	0 ± 0.00058	0.00301 ± 0.003
FTCOLL	12/25/96	06	24	F	1.7835 ± 0.3644	0.9837	0.2405	120.0478	1.28147 ± 0.05717	0.37086 ± 0.07755	0.07009 ± 0.00278	0.11491 ± 0.03655	0 ± 0.00018	0 ± 0.00046	0.00531 ± 0.00529
FTCOLL	12/26/96	06	24	F	5.7299 ± 0.5292	0.98751	0.22401	106.0439	1.14508 ± 0.05109	2.48464 ± 0.51954	1.47369 ± 0.05841	0.67278 ± 0.21402	0 ± 0.00044	0 ± 0.00092	0.01618 ± 0.01611
FTCOLL	12/30/96	06	24	F	8.3412 ± 0.672	0.97151	0.39489	122.251	4.27114 ± 0.19055	±	3.66657 ± 0.14533	0.49648 ± 0.15794	0 ± 0.00006	0 ± 0.00032	0.01168 ± 0.01163
FTCOLL	12/31/96	06	24	F	9.6819 ± 0.75	0.96784	0.43073	105.0524	3.25014 ± 0.145	2.62016 ± 0.54787	3.28369 ± 0.13015	0.62346 ± 0.19833	0 ± 0.00004	0 ± 0.00029	0.02573 ± 0.02562
FTCOLL	01/01/97	06	24	F	6.1745 ± 0.5513	0.9737	0.38161	105.942	2.56162 ± 0.11428	1.87758 ± 0.3926	1.61164 ± 0.06388	0.23559 ± 0.07495	0 ± 0.00004	0 ± 0.00039	0.00382 ± 0.00381
FTCOLL	01/02/97	06	24	F	4.2898 ± 0.4549	0.92817	0.82221	110.8447	0.75322 ± 0.0336	1.50208 ± 0.31408	1.72296 ± 0.06829	0.38273 ± 0.12175	0 ± 0.00002	0 ± 0.00017	0.02642 ± 0.02631
FTCOLL	01/06/97	06	24	F	3.0466 ± 0.3986	0.97973	0.28115	91.64814	1.01517 ± 0.04529	0.8418 ± 0.17602	0.89626 ± 0.03552	0.32608 ± 0.10373	0 ± 0.00007	0 ± 0.00022	±
FTCOLL	01/07/97	06	24	F	3.5392 ± 0.4261	0.95386	0.6025	93.44357	1.01729 ± 0.04538	1.01289 ± 0.2118	0.88646 ± 0.03514	0.66162 ± 0.21047	0 ± 0.00006	0 ± 0.00019	0.00971 ± 0.00967
FTCOLL	01/12/97	06	24	F	1.7341 ± 0.3663	0.96419	0.55485	84.19773	0.18462 ± 0.00824	1.13406 ± 0.23713	0.3062 ± 0.01214	0.17684 ± 0.05625	0 ± 0.00015	0 ± 0.00021	0.00899 ± 0.00895
FTCOLL	01/13/97	06	24	F	3.0304 ± 0.4065	0.98439	0.25643	91.72906	1.33902 ± 0.05974	0.85559 ± 0.1789	0.79209 ± 0.0314	0.09894 ± 0.03148	0 ± 0.00018	0 ± 0.0006	0.00754 ± 0.00751
FTCOLL	01/14/97	06	24	F	5.8378 ± 0.5337	0.98588	0.24047	88.40793	3.06519 ± 0.13675	1.32585 ± 0.27724	1.27768 ± 0.05064	0.22619 ± 0.07196	0 ± 0.00034	0 ± 0.00173	0.00395 ± 0.00393
FTCOLL	01/15/97	06	24	F	2.8338 ± 0.4056	0.97464	0.42815	99.23792	1.67552 ± 0.07475	0.53403 ± 0.11167	0.60444 ± 0.02396	0.0413 ± 0.01314	0 ± 0.00024	0 ± 0.00048	0.04044 ± 0.04026
FTCOLL	01/16/97	06	24	F	5.0542 ± 0.4945	0.98921	0.19074	84.63582	2.44294 ± 0.10899	1.14298 ± 0.239	1.43368 ± 0.05683	0.0712 ± 0.02265	0 ± 0.00039	0 ± 0.001	0.02804 ± 0.02792
FTCOLL	01/17/97	06	24	F	7.1857 ± 0.6079	0.98815	0.20442	98.62191	3.85355 ± 0.17192	0.81603 ± 0.17063	2.49123 ± 0.09874	0.09752 ± 0.03102	0 ± 0.00028	0 ± 0.00111	0.01209 ± 0.01204
FTCOLL	01/18/97	06	24	F	7.3794 ± 0.6125	0.96719	0.56913	97.50018	3.67078 ± 0.16377	1.69118 ± 0.35363	1.97664 ± 0.07835	0.16854 ± 0.05362	0 ± 0.00011	0 ± 0.00107	±
FTCOLL	01/19/97	06	24	F	6.4792 ± 0.5686	0.97817	0.32126	93.78861	3.98026 ± 0.17757	1.11379 ± 0.23289	1.41462 ± 0.05607	0.06531 ± 0.02078	0 ± 0.00005	0 ± 0.00048	±

Table C.1B-1 (continued)
24-Hour Contributions to Total Carbon at Core and Satellite Sites for Individual Samples - NFRAQS Winter 1996/97, Conventional CMB

Site ID	Sample Date	Start Hour	Duration (hrs)	Size	Total Carbon (μg/m^3)	R-square	Chi-square	Percent of Mass	Light-Duty Gasoline Vehicle Exhaust	Diesel Exhaust Diesel Exhaust	Paved Road Dust	Meat Cooking and Wood Combustion	Ammonium Sulfate	Ammonium Nitrate	Coal-Fired Power Plant
FTCOLL	01/20/97	06	24	F	7.716 ± 0.6338	0.98182	0.30262	106.2038	4.52364 ± 0.20181	0.46783 ± 0.09782	2.6744 ± 0.106	0.15871 ± 0.05049	0 ± 0.00008	0 ± 0.00082	±
FTCOLL	01/27/97	06	24	F	3.115 ± 0.4042	0.98598	0.24124	93.5173	1.40446 ± 0.06266	0.61856 ± 0.12934	1.13202 ± 0.04487	0.00772 ± 0.00245	0 ± 0.00039	0 ± 0.00099	0.01128 ± 0.01123
FTCOLL	01/29/97	06	24	F	4.4597 ± 0.4589	0.98593	0.24241	94.7873	2.21189 ± 0.09868	0.44187 ± 0.0924	1.83449 ± 0.07271	0.01728 ± 0.0055	0 ± 0.00026	0 ± 0.00145	0.01989 ± 0.0198
FTCOLL	01/30/97	06	24	F	5.4208 ± 0.5098	0.97393	0.44589	102.6004	3.3756 ± 0.1506	±	1.74278 ± 0.06908	0.33641 ± 0.10702	0 ± 0.00012	0 ± 0.00105	0.01428 ± 0.01422
EVANS	12/18/96	06	24	F	2.12273 ± 0.37911	0.96393	0.53158	97.59219	0.77488 ± 0.03457	0.94071 ± 0.1967	0.51774 ± 0.02052	0.04374 ± 0.01392	0 ± 0.00013	0 ± 0.00012	0.0364 ± 0.03624
EVANS	12/19/96	06	24	F	5.42677 ± 0.50146	0.98589	0.23648	88.45834	1.09046 ± 0.04865	2.21275 ± 0.46269	2.02481 ± 0.08026	0.31502 ± 0.10021	0 ± 0.00028	0 ± 0.00086	0.00743 ± 0.00739
EVANS	01/07/97	06	24	F	3.0257 ± 0.39726	0.98428	0.21522	95.91374	0.42798 ± 0.01909	1.80016 ± 0.37641	0.61749 ± 0.02447	0.35315 ± 0.11234	0 ± 0.00011	0 ± 0.00034	0.00989 ± 0.00985
EVANS	01/13/97	06	24	F	3.77947 ± 0.41693	0.97646	0.42592	97.27538	2.04592 ± 0.09128	1.17716 ± 0.24614	0.64745 ± 0.02566	0.09581 ± 0.03048	0 ± 0.0004	0 ± 0.00093	0.03307 ± 0.03293
EVANS	01/14/97	06	24	F	5.55005 ± 0.5144	0.98366	0.31031	94.20854	3.71442 ± 0.16571	0.72037 ± 0.15063	1.13316 ± 0.04491	0.14964 ± 0.0476	0 ± 0.00102	0 ± 0.00216	0.00975 ± 0.00971
EVANS	01/15/97	06	24	F	2.72342 ± 0.44545	0.95543	0.73735	101.1532	1.88898 ± 0.08427	0.57206 ± 0.11962	0.43105 ± 0.01709	0.03251 ± 0.01034	0 ± 0.00044	0 ± 0.00051	0.0387 ± 0.03853
EVANS	01/16/97	06	24	F	4.45713 ± 0.44952	0.97972	0.37555	85.73607	2.64528 ± 0.11802	0.78765 ± 0.1647	1.11125 ± 0.04405	0.08972 ± 0.02854	0 ± 0.00049	0 ± 0.00079	0.03416 ± 0.03401
EVANS	01/17/97	06	24	F	9.54333 ± 0.75029	0.98456	0.30133	90.5602	5.69673 ± 0.25415	1.15862 ± 0.24227	2.64913 ± 0.105	0.21567 ± 0.06861	0 ± 0.00082	0 ± 0.00269	0.03564 ± 0.03549
EVANS	01/18/97	06	24	F	8.84495 ± 0.69112	0.98571	0.25087	98.33311	5.07888 ± 0.22659	1.4759 ± 0.30861	2.39085 ± 0.09476	0.12377 ± 0.03937	0 ± 0.0005	0 ± 0.00297	±
EVANS	01/19/97	06	24	F	6.73997 ± 0.56876	0.98906	0.19612	95.45865	4.48916 ± 0.20028	0.82457 ± 0.17242	1.58768 ± 0.06293	0.05876 ± 0.01869	0 ± 0.00028	0 ± 0.00222	0.00835 ± 0.00831
EVANS	01/20/97	06	24	F	10.52147 ± 0.80773	0.97123	0.53447	94.7924	6.07703 ± 0.27112	0.89472 ± 0.18709	3.69648 ± 0.14651	0.16445 ± 0.05231	0 ± 0.00028	0 ± 0.00237	0.01005 ± 0.01
EVANS	01/27/97	06	24	F	2.84185 ± 0.42679	0.96505	0.57332	90.37071	1.59771 ± 0.07128	0.725 ± 0.1516	0.71314 ± 0.02827	0.01135 ± 0.00361	0 ± 0.00041	0 ± 0.00072	0.02548 ± 0.02537
EVANS	01/28/97	06	24	F	7.4919 ± 0.62418	0.985	0.27906	89.99394	4.298 ± 0.19175	0.84121 ± 0.1759	2.51811 ± 0.09981	0.03406 ± 0.01083	0 ± 0.00063	0 ± 0.00184	0.01585 ± 0.01578
EVANS	01/29/97	06	24	F	4.42147 ± 0.45283	0.97875	0.32941	103.5719	3.16826 ± 0.14135	0.26021 ± 0.05441	1.1418 ± 0.04526	0.04498 ± 0.01431	0 ± 0.00022	0 ± 0.00075	0.00162 ± 0.00161
EVANS	01/30/97	06	24	F	5.6519 ± 0.52142	0.93072	1.27257	91.4053	3.50698 ± 0.15646	0.64668 ± 0.13522	1.71882 ± 0.06813	0.01215 ± 0.00386	0 ± 0.00035	0 ± 0.00212	0.06579 ± 0.06551
MASTER	12/19/96	06	24	F	2.4148 ± 0.3842	0.98382	0.21832	76.39304	±	1.23285 ± 0.25779	0.73158 ± 0.029	0.50288 ± 0.15997	0 ± 0.00019	0 ± 0.00069	0.00519 ± 0.00516
MASTER	12/25/96	06	24	F	0.8242 ± 0.3812	0.95852	0.46025	90.84805	±	0.58038 ± 0.12136	±	0.68164 ± 0.21684	0 ± 0.00023	0 ± 0.00047	0.00223 ± 0.00222
MASTER	12/31/96	06	24	F	1.8681 ± 0.3578	0.94873	0.67545	62.35867	±	0.94064 ± 0.19669	0.56253 ± 0.0223	0.79647 ± 0.25337	0 ± 0.00008	0 ± 0.00035	0.00961 ± 0.00957
MASTER	01/02/97	06	24	F	3.8697 ± 0.4144	0.95168	0.51645	99.87712	±	1.63731 ± 0.34236	0.73221 ± 0.02902	2.32402 ± 0.73931	0 ± 0.00005	0 ± 0.00053	0.06005 ± 0.05979
MASTER	01/06/97	06	24	F	1.238 ± 0.3814	0.98291	0.22664	97.4642	±	0.7295 ± 0.15254	0.23114 ± 0.00916	0.39349 ± 0.12518	0 ± 0.00012	0 ± 0.00034	±
MASTER	01/07/97	06	24	F	2.4418 ± 0.3581	0.94355	0.50102	80.51696	±	0.89788 ± 0.18775	0.11568 ± 0.00459	2.24534 ± 0.71428	0 ± 0.00008	0 ± 0.00029	0.01846 ± 0.01838
MASTER	01/13/97	06	24	F	4.2963 ± 0.457	0.98279	0.28705	81.78017	0.6727 ± 0.03001	2.28404 ± 0.47759	0.84161 ± 0.03336	0.54299 ± 0.17273	0 ± 0.00073	0 ± 0.00176	0.01023 ± 0.01018
MASTER	01/14/97	06	24	F	2.3653 ± 0.3812	0.98179	0.24104	91.60244	0.05861 ± 0.00261	1.6563 ± 0.34633	0.31274 ± 0.0124	0.37616 ± 0.11966	0 ± 0.00032	0 ± 0.00103	0.00249 ± 0.00248
MASTER	01/15/97	06	24	F	1.3098 ± 0.4164	0.97238	0.24964	96.72958	±	1.03364 ± 0.21613	±	0.3352 ± 0.10663	0 ± 0.0002	0 ± 0.00004	±
MASTER	01/16/97	06	24	F	2.2193 ± 0.3776	0.9744	0.34776	87.00994	±	1.30859 ± 0.27362	0.33384 ± 0.01323	0.81128 ± 0.25808	0 ± 0.00034	0 ± 0.00059	0.00719 ± 0.00716
MASTER	01/17/97	06	24	F	7.868 ± 0.6474	0.98841	0.2109	88.57611	1.99953 ± 0.08921	3.359 ± 0.70237	1.73 ± 0.06857	0.82368 ± 0.26203	0 ± 0.00108	0 ± 0.00291	0.01648 ± 0.01641
MASTER	01/18/97	06	24	F	4.578 ± 0.4729	0.98978	0.1557	89.2774	2.30781 ± 0.10296	1.24986 ± 0.26135	0.83613 ± 0.03314	0.20058 ± 0.06381	0 ± 0.00037	0 ± 0.00234	0.02818 ± 0.02806
MASTER	01/19/97	06	24	F	6.3245 ± 0.5593	0.98825	0.17042	88.34245	2.55049 ± 0.11379	2.60205 ± 0.54409	0.75474 ± 0.02991	0.43076 ± 0.13703	0 ± 0.00035	0 ± 0.00315	0.03073 ± 0.0306
MASTER	01/20/97	06	24	F	7.0207 ± 0.5989	0.98789	0.19858	87.44274	4.11377 ± 0.18353	0.90828 ± 0.18992	1.89529 ± 0.07512	0.15711 ± 0.04998	0 ± 0.00036	0 ± 0.00245	0.02124 ± 0.02115
MASTER	01/27/97	06	24	F	1.8258 ± 0.3631	0.9597	0.48062	82.1172	0.8154 ± 0.03638	0.77288 ± 0.16161	0.17946 ± 0.00711	0.12028 ± 0.03826	0 ± 0.00022	0 ± 0.00053	0.02775 ± 0.02763
MASTER	01/28/97	06	24	F	3.9492 ± 0.443	0.99159	0.1525	95.04123	2.2461 ± 0.10021	0.78969 ± 0.16512	0.86371 ± 0.03423	0.05795 ± 0.01844	0 ± 0.00047	0 ± 0.00156	0.02117 ± 0.02108
MASTER	01/29/97	06	24	F	1.9581 ± 0.3666	0.96255	0.61875	124.941	1.46674 ± 0.06544	0.29707 ± 0.06212	0.20911 ± 0.00829	0.00339 ± 0.00108	0 ± 0.00017	0 ± 0.00046	0.03801 ± 0.03785
MASTER	01/30/97	06	24	F	3.8819 ± 0.4377	0.98843	0.20641	106.4253	2.35903 ± 0.10524	0.52488 ± 0.10975	0.99841 ± 0.03957	0.02932 ± 0.00933	0 ± 0.00032	0 ± 0.00202	0.01912 ± 0.01904

Table C.1B-2
24-Hour Contributions to Organic Carbon at Core and Satellite Sites for Individual Samples - NFRAQS Winter 1996/97, Conventional CMB

Site ID	Sample Date	Start Hour	Duration (hrs)	Size	Organic Carbon (µg/m^3)	R-square	Chi-square	Percent of Mass	Light-Duty Gasoline Vehicle Exhaust	Diesel Exhaust Diesel Exhaust	Paved Road Dust	Meat Cooking and Wood Combustion	Ammonium Sulfate	Ammonium Nitrate	Coal-Fired Power Plant
BRIGHT	12/18/96	06	24	F	2.16178 ± 0.3294	0.9918	0.1219	117.659	1.62732 ± 0.10099	0.26067 ± 0.05736	0.24064 ± 0.10026	0.05461 ± 0.02187	0 ± 0.0001	0 ± 0.00013	0 ± 0.00655
BRIGHT	12/19/96	06	24	F	3.53452 ± 0.43711	0.98882	0.14971	92.21834	2.52438 ± 0.15667	0.67425 ± 0.14836	0.33306 ± 0.13876	0.05897 ± 0.02362	0 ± 0.00017	0 ± 0.00045	±
BRIGHT	12/25/96	06	24	F	0.65013 ± 0.3016	0.98823	0.13271	110.0184	0.04056 ± 0.00252	0.58135 ± 0.12792	0.02894 ± 0.01206	0.03763 ± 0.01507	0 ± 0.00015	0 ± 0.00036	0 ± 0.00469
BRIGHT	12/26/96	06	24	F	1.08895 ± 0.28327	0.98415	0.22945	105.0126	0.05962 ± 0.0037	0.87808 ± 0.19321	0.09139 ± 0.03807	0.09941 ± 0.03981	0 ± 0.00023	0 ± 0.0005	0 ± 0.00908
BRIGHT	12/30/96	06	24	F	1.34423 ± 0.31825	0.96654	0.31062	107.8098	0.77493 ± 0.04809	0.34773 ± 0.07651	0.19712 ± 0.08212	0.08652 ± 0.03465	0 ± 0.00005	0 ± 0.00004	0 ± 0.011
BRIGHT	12/31/96	06	24	F	2.1651 ± 0.33002	0.95806	0.54679	118.4375	0.98106 ± 0.06089	0.91272 ± 0.20084	0.28751 ± 0.11978	0.09165 ± 0.03671	0 ± 0.00005	0 ± 0.00015	0 ± 0.01682
BRIGHT	01/02/97	06	24	F	2.15622 ± 0.3301	0.97534	0.22823	135.4146	0.69645 ± 0.04322	1.0817 ± 0.23802	0.24962 ± 0.104	0.18077 ± 0.0724	0 ± 0.00004	0 ± 0.00007	0 ± 0.00878
BRIGHT	01/06/97	06	24	F	1.34833 ± 0.31012	0.98876	0.15218	102.2595	0.83869 ± 0.05205	0.34717 ± 0.07639	0.17635 ± 0.07347	0.01396 ± 0.00559	0 ± 0.00008	0 ± 0.00028	0 ± 0.004
BRIGHT	01/07/97	06	24	F	1.91163 ± 0.32891	0.98856	0.17359	106.4701	1.29151 ± 0.08015	0.29139 ± 0.06412	0.23797 ± 0.09914	0.14115 ± 0.05653	0 ± 0.00009	0 ± 0.00038	0 ± 0.00471
BRIGHT	01/12/97	06	24	F	1.50367 ± 0.32816	0.955	0.60683	85.98517	0.76173 ± 0.04727	0.70848 ± 0.15589	0.0829 ± 0.03454	0.0508 ± 0.02035	0 ± 0.00011	0 ± 0.00024	0 ± 0.01654
BRIGHT	01/13/97	06	24	F	3.78395 ± 0.41909	0.98847	0.19441	91.7846	2.55948 ± 0.15885	0.99422 ± 0.21877	0.2194 ± 0.0914	0.0498 ± 0.01994	0 ± 0.00029	0 ± 0.00089	0 ± 0.00978
BRIGHT	01/14/97	06	24	F	3.94187 ± 0.4409	0.98902	0.18011	89.94721	2.98165 ± 0.18505	0.68745 ± 0.15127	0.25686 ± 0.10701	0.03868 ± 0.01549	0 ± 0.00043	0 ± 0.00068	±
BRIGHT	01/15/97	06	24	F	1.276 ± 0.28604	0.9852	0.2198	85.70633	0.81644 ± 0.05067	0.39968 ± 0.08795	0.04767 ± 0.01986	0.04699 ± 0.01882	0 ± 0.00017	0 ± 0.00016	0 ± 0.00791
BRIGHT	01/16/97	06	24	F	2.60862 ± 0.34965	0.97924	0.37286	90.97844	1.79562 ± 0.11144	0.57802 ± 0.12719	0.21668 ± 0.09027	0.06686 ± 0.02678	0 ± 0.00022	0 ± 0.00041	0 ± 0.01522
BRIGHT	01/17/97	06	24	F	4.62815 ± 0.48403	0.97421	0.44112	94.03374	3.44119 ± 0.21357	0.51229 ± 0.11272	0.5706 ± 0.23772	0.1681 ± 0.06733	0 ± 0.00035	0 ± 0.00116	±
BRIGHT	01/18/97	06	24	F	2.46767 ± 0.34876	0.98944	0.14858	116.6143	1.82506 ± 0.11327	0.37429 ± 0.08236	0.27831 ± 0.11595	0.03712 ± 0.01487	0 ± 0.00004	0 ± 0.00032	0 ± 0.00221
BRIGHT	01/19/97	06	24	F	2.9412 ± 0.37402	0.98722	0.18982	98.87736	2.3197 ± 0.14397	0.42791 ± 0.09416	0.22258 ± 0.09273	0.04372 ± 0.01751	0 ± 0.00009	0 ± 0.00069	0 ± 0.00189
BRIGHT	01/27/97	06	24	F	1.58718 ± 0.31887	0.98881	0.17027	96.1968	0.84582 ± 0.05249	0.64825 ± 0.14264	0.15556 ± 0.06481	0.0222 ± 0.00889	0 ± 0.00015	0 ± 0.00035	0 ± 0.00441
BRIGHT	01/29/97	06	24	F	1.66727 ± 0.3084	0.98755	0.17522	107.8725	1.25775 ± 0.07806	0.27324 ± 0.06012	0.10205 ± 0.04251	0.02071 ± 0.00829	0 ± 0.00011	0 ± 0.00017	0 ± 0.00458
BRIGHT	01/30/97	06	24	F	1.88077 ± 0.3386	0.94924	0.38334	142.3274	1.4715 ± 0.09132	0.26858 ± 0.0591	0.14281 ± 0.0595	0.04182 ± 0.01675	0 ± 0.00002	0 ± 0.00006	0 ± 0.01114
LONGMO	12/18/96	06	24	F	2.3402 ± 0.3618	0.98962	0.17894	93.68561	1.21208 ± 0.07522	0.80024 ± 0.17608	0.2745 ± 0.11436	0.12677 ± 0.05077	0 ± 0.00012	0 ± 0.00019	0 ± 0.00735
LONGMO	12/19/96	06	24	F	3.092 ± 0.3987	0.9759	0.44234	98.54799	2.08228 ± 0.12923	0.7517 ± 0.1654	0.29678 ± 0.12364	0.07507 ± 0.03007	0 ± 0.00012	0 ± 0.00045	0 ± 0.02101
LONGMO	12/25/96	06	24	F	0.6704 ± 0.2887	0.95974	0.6003	77.26418	0.09904 ± 0.00615	0.56428 ± 0.12416	0.00895 ± 0.00373	0.06638 ± 0.02659	0 ± 0.00008	0 ± 0.00034	0 ± 0.00824
LONGMO	12/26/96	06	24	F	1.3255 ± 0.3405	0.98376	0.25537	98.24805	±	0.96878 ± 0.21317	0.1042 ± 0.04341	0.32903 ± 0.13178	0 ± 0.00032	0 ± 0.00061	0 ± 0.00794
LONGMO	01/06/97	06	24	F	2.2902 ± 0.3453	0.98952	0.16828	113.6065	1.56659 ± 0.09723	0.57657 ± 0.12687	0.14547 ± 0.06061	0.02426 ± 0.00971	0 ± 0.00007	0 ± 0.00032	0 ± 0.01255
LONGMO	01/07/97	06	24	F	1.3904 ± 0.3187	0.96592	0.46705	115.7217	±	0.99434 ± 0.21879	0.16319 ± 0.06799	0.3019 ± 0.12092	0 ± 0.00005	0 ± 0.00024	0 ± 0.01557
LONGMO	01/13/97	06	24	F	2.9734 ± 0.3856	0.98743	0.1954	96.19735	1.62467 ± 0.10083	1.11127 ± 0.24452	0.22861 ± 0.09524	0.02381 ± 0.00954	0 ± 0.00023	0 ± 0.00075	0 ± 0.0134
LONGMO	01/14/97	06	24	F	4.9153 ± 0.5136	0.99211	0.14891	94.56229	3.30556 ± 0.20515	1.29606 ± 0.28518	0.24823 ± 0.10341	0.06111 ± 0.02447	0 ± 0.00056	0 ± 0.00141	0 ± 0.01502
LONGMO	01/15/97	06	24	F	1.5122 ± 0.3091	0.98202	0.30986	107.7938	0.9202 ± 0.05711	0.42104 ± 0.09265	0.17559 ± 0.07315	0.04492 ± 0.01799	0 ± 0.00019	0 ± 0.00026	0 ± 0.00609
LONGMO	01/16/97	06	24	F	3.7872 ± 0.4349	0.9899	0.17696	80.86354	2.53458 ± 0.1573	0.94222 ± 0.20733	0.24851 ± 0.10353	0.08294 ± 0.03322	0 ± 0.00032	0 ± 0.00073	0 ± 0.01571
LONGMO	01/17/97	06	24	F	4.7995 ± 0.5054	0.99048	0.17535	93.60557	3.31181 ± 0.20554	1.06546 ± 0.23444	0.42005 ± 0.175	0.072 ± 0.02884	0 ± 0.0003	0 ± 0.00164	0 ± 0.03047
LONGMO	01/18/97	06	24	F	3.4428 ± 0.4114	0.99117	0.14914	92.57707	2.31021 ± 0.14338	0.86853 ± 0.19111	0.26138 ± 0.10889	0.06785 ± 0.02717	0 ± 0.0001	0 ± 0.00095	0 ± 0.00461
LONGMO	01/19/97	06	24	F	3.4449 ± 0.4113	0.98951	0.17283	120.5118	2.66284 ± 0.16526	0.61565 ± 0.13547	0.16147 ± 0.06727	0.0607 ± 0.02431	0 ± 0.00008	0 ± 0.00113	0 ± 0.00047
LONGMO	01/20/97	06	24	F	2.4613 ± 0.356	0.98845	0.18996	110.6792	1.68891 ± 0.10482	0.2455 ± 0.05402	0.52328 ± 0.218	0.07722 ± 0.03093	0 ± 0.00006	0 ± 0.00053	0 ± 0.00696
LONGMO	01/27/97	06	24	F	1.4447 ± 0.3079	0.97735	0.36595	88.72358	0.73503 ± 0.04562	0.64253 ± 0.14138	0.13453 ± 0.05605	0.02841 ± 0.01138	0 ± 0.00018	0 ± 0.00054	0 ± 0.00569
LONGMO	01/28/97	06	24	F	2.9379 ± 0.3842	0.98397	0.26647	88.54654	2.07331 ± 0.12867	0.32849 ± 0.07228	0.54261 ± 0.22606	0.09896 ± 0.03964	0 ± 0.00029	0 ± 0.0008	0 ± 0.00472
LONGMO	01/29/97	06	24	F	2.004 ± 0.3335	0.98115	0.31904	93.4498	1.62904 ± 0.1011	0.24089 ± 0.053	0.18539 ± 0.07724	0.03039 ± 0.01217	0 ± 0.00018	0 ± 0.0005	0 ± 0.00618
LONGMO	01/30/97	06	24	F	1.4567 ± 0.3292	0.97226	0.4463	47.59289	0.95221 ± 0.0591	0.31484 ± 0.06928	0.20962 ± 0.08733	0.06324 ± 0.02533	0 ± 0.00008	0 ± 0.0005	0 ± 0.0187
FTCOLL	12/18/96	06	24	F	2.3477 ± 0.3577	0.92663	1.02211	110.0238	0.82046 ± 0.05092	0.7734 ± 0.17018	0.10344 ± 0.04309	0.69321 ± 0.27764	0 ± 0.00008	0 ± 0.00011	0 ± 0.02382
FTCOLL	12/19/96	06	24	F	3.9033 ± 0.4448	0.97275	0.48621	99.85317	2.21715 ± 0.1376	1.00084 ± 0.22022	0.42993 ± 0.17912	0.33472 ± 0.13406	0 ± 0.00011	0 ± 0.00041	0 ± 0.00206
FTCOLL	12/25/96	06	24	F	1.4973 ± 0.3198	0.9837	0.2405	120.0478	1.11041 ± 0.06891	0.32224 ± 0.07091	0.01412 ± 0.00588	0.10629 ± 0.04257	0 ± 0.00012	0 ± 0.00032	0 ± 0.00364
FTCOLL	12/26/96	06	24	F	4.0118 ± 0.4523	0.98751	0.22401	106.0439	0.99223 ± 0.06158	2.15896 ± 0.47506	0.29699 ± 0.12373	0.6223 ± 0.24924	0 ± 0.00031	0 ± 0.00066	0 ± 0.01107
FTCOLL	12/30/96	06	24	F	4.7936 ± 0.5014	0.97151	0.39489	122.251	3.701 ± 0.22969	±	0.73891 ± 0.30784	0.45923 ± 0.18393	0 ± 0.00004	0 ± 0.00023	0 ± 0.00799
FTCOLL	12/31/96	06	24	F	6.2195 ± 0.5982	0.96784	0.43073	105.0524	2.81629 ± 0.17479	2.27671 ± 0.50097	0.66175 ± 0.27569	0.57667 ± 0.23096	0 ± 0.00003	0 ± 0.00021	0 ± 0.01761
FTCOLL	01/01/97	06	24	F	4.2826 ± 0.4695	0.9737	0.38161	105.942	2.21968 ± 0.13776	1.63147 ± 0.35899	0.32479 ± 0.13531	0.21792 ± 0.08728	0 ± 0.00003	0 ± 0.00028	0 ± 0.00262
FTCOLL	01/02/97	06	24	F	2.5684 ± 0.3651	0.92817	0.82221	110.8447	0.65268 ± 0.04051	1.30519 ± 0.28719	0.34722 ± 0.14466	0.35401 ± 0.14179	0 ± 0.00001	0 ± 0.00012	0 ± 0.01808
FTCOLL	01/06/97	06	24	F	2.0585 ± 0.3377	0.97973	0.28115	91.64814	0.87966 ± 0.05459	0.73146 ± 0.16095	0.18062 ± 0.07525	0.30161 ± 0.1208	0 ± 0.00005	0 ± 0.00016	±
FTCOLL	01/07/97	06	24	F	2.5055 ± 0.3671	0.95386	0.6025	93.44357	0.88149 ± 0.05471	0.88012 ± 0.19366	0.17865 ± 0.07443	0.61198 ± 0.2451	0 ± 0.00004	0 ± 0.00014	0 ± 0.00665
FTCOLL	01/12/97	06	24	F	1.2904 ± 0.3156	0.96419	0.55485	84.19773	0.15997 ± 0.00993	0.98541 ± 0.21683	0.06171 ± 0.02571	0.16357 ± 0.06551	0 ± 0.00011	0 ± 0.00015	0 ± 0.00615
FTCOLL	01/13/97	06	24	F	2.092 ± 0.3472	0.98439	0.25643	91.72906	1.16028 ± 0.07201	0.74344 ± 0.16359	0.15963 ± 0.0665	0.09152 ± 0.03665	0 ± 0.00013	0 ± 0.00042	0 ± 0.00516
FTCOLL	01/14/97	06	24	F	4.2142 ± 0.4637	0.98588	0.24047	88.40793	2.65602 ± 0.16484	1.15206 ± 0.2535	0.25749 ± 0.10727	0.20922 ± 0.0838	0 ± 0.00024	0 ± 0.00123	0 ± 0.0027
FTCOLL	01/15/97	06	24	F	2.0131 ± 0.3493	0.97464	0.42815	99.23792	1.45186 ± 0.09011	0.46403 ± 0.10211	0.12181 ± 0.05075	0.0382 ± 0.0153	0 ± 0.00017	0 ± 0.00034	0 ± 0.02767
FTCOLL	01/16/97	06	24	F	3.3942 ± 0.4149	0.98921	0.19074	84.63582	2.11684 ± 0.13138	0.99316 ± 0.21853	0.28892 ± 0.12037	0.06585 ± 0.02638	0 ± 0.00027	0 ± 0.00071	0 ± 0.01919
FTCOLL	01/17/97	06	24	F	4.5519 ± 0.487	0.98815	0.20442	98.62191	3.33916 ± 0.20724	0.70906 ± 0.15602	0.50205 ± 0.20916	0.0902 ± 0.03613	0 ± 0.0002	0 ± 0.00079	0 ± 0.00827
FTCOLL	01/18/97	06	24	F	5.0781 ± 0.5176	0.96719	0.56913	97.50018	3.18078 ± 0.19741	1.4695 ± 0.32335	0.39835 ± 0.16596	0.15589 ± 0.06244	0 ± 0.00008	0 ± 0.00076	±
FTCOLL	01/19/97	06	24	F	4.6696 ± 0.4959	0.97817	0.32126	93.78861	3.44895 ± 0.21405	0.9678 ± 0.21295	0.28508 ± 0.11877	0.06041 ± 0.02419	0 ± 0.00003	0 ± 0.00034	±

Table C.1B-2 (continued)
24-Hour Contributions to Organic Carbon at Core and Satellite Sites for Individual Samples - NFRAQS Winter 1996/97, Conventional CMB

Site ID	Sample Date	Start Hour	Duration (hrs)	Size	Organic Carbon (µg/m^3)	R-square	Chi-square	Percent of Mass	Light-Duty Gasoline Vehicle Exhaust	Diesel Exhaust Diesel Exhaust	Paved Road Dust	Meat Cooking and Wood Combustion	Ammonium Sulfate	Ammonium Nitrate	Coal-Fired Power Plant
FTCOLL	01/20/97	06	24	F	4.902 ± 0.508	0.98182	0.30262	106.2038	3.91979 ± 0.24327	0.4065 ± 0.08945	0.53897 ± 0.22454	0.1468 ± 0.05879	0 ± 0.00005	0 ± 0.00058	±
FTCOLL	01/27/97	06	24	F	1.9257 ± 0.3352	0.98598	0.24124	93.5173	1.21698 ± 0.07553	0.53748 ± 0.11827	0.22813 ± 0.09504	0.00714 ± 0.00286	0 ± 0.00028	0 ± 0.00071	0 ± 0.00772
FTCOLL	01/29/97	06	24	F	2.6118 ± 0.3666	0.98593	0.24241	94.7873	1.91663 ± 0.11895	0.38395 ± 0.08448	0.3697 ± 0.15402	0.01599 ± 0.0064	0 ± 0.00019	0 ± 0.00103	0 ± 0.01361
FTCOLL	01/30/97	06	24	F	3.5394 ± 0.4206	0.97393	0.44589	102.6004	2.925 ± 0.18153	±	0.35122 ± 0.14632	0.31117 ± 0.12462	0 ± 0.00008	0 ± 0.00075	0 ± 0.00977
EVANS	12/18/96	06	24	F	1.57605 ± 0.29719	0.96393	0.53158	97.59219	0.67145 ± 0.04167	0.8174 ± 0.17986	0.10434 ± 0.04347	0.04046 ± 0.01621	0 ± 0.00009	0 ± 0.00009	0 ± 0.02491
EVANS	12/19/96	06	24	F	3.47435 ± 0.399	0.98589	0.23648	88.45834	0.9449 ± 0.05864	1.92271 ± 0.42307	0.40806 ± 0.17	0.29139 ± 0.1167	0 ± 0.0002	0 ± 0.00061	0 ± 0.00508
EVANS	01/07/97	06	24	F	2.33278 ± 0.34281	0.98428	0.21522	95.91374	0.37085 ± 0.02302	1.5642 ± 0.34419	0.12444 ± 0.05184	0.32665 ± 0.13083	0 ± 0.00007	0 ± 0.00024	0 ± 0.00677
EVANS	01/13/97	06	24	F	2.92512 ± 0.36151	0.97646	0.42592	97.27538	1.77281 ± 0.11002	1.02286 ± 0.22507	0.13048 ± 0.05436	0.08862 ± 0.03549	0 ± 0.00028	0 ± 0.00066	0 ± 0.02263
EVANS	01/14/97	06	24	F	4.16757 ± 0.44631	0.98366	0.31031	94.20854	3.2186 ± 0.19975	0.62594 ± 0.13773	0.22836 ± 0.09514	0.13841 ± 0.05544	0 ± 0.00073	0 ± 0.00153	0 ± 0.00667
EVANS	01/15/97	06	24	F	2.14158 ± 0.35524	0.95543	0.73735	101.1532	1.63683 ± 0.10159	0.49707 ± 0.10938	0.08687 ± 0.03619	0.03007 ± 0.01204	0 ± 0.00031	0 ± 0.00036	0 ± 0.02648
EVANS	01/16/97	06	24	F	3.19933 ± 0.37677	0.97972	0.37555	85.73607	2.29218 ± 0.14226	0.68441 ± 0.1506	0.22395 ± 0.0933	0.08299 ± 0.03324	0 ± 0.00035	0 ± 0.00056	0 ± 0.02338
EVANS	01/17/97	06	24	F	6.59832 ± 0.62793	0.98456	0.30133	90.5602	4.93629 ± 0.30636	1.00675 ± 0.22152	0.53387 ± 0.22242	0.19948 ± 0.07989	0 ± 0.00058	0 ± 0.00191	0 ± 0.02439
EVANS	01/18/97	06	24	F	6.19572 ± 0.58097	0.98571	0.25087	98.33311	4.40092 ± 0.27313	1.28244 ± 0.28219	0.48182 ± 0.20073	0.11448 ± 0.04585	0 ± 0.00035	0 ± 0.00211	±
EVANS	01/19/97	06	24	F	4.8872 ± 0.48875	0.98906	0.19612	95.45865	3.88992 ± 0.24142	0.71649 ± 0.15766	0.31996 ± 0.1333	0.05435 ± 0.02177	0 ± 0.0002	0 ± 0.00158	0 ± 0.00571
EVANS	01/20/97	06	24	F	6.74983 ± 0.63714	0.97123	0.53447	94.7924	5.26583 ± 0.32681	0.77744 ± 0.17107	0.74494 ± 0.31035	0.15211 ± 0.06092	0 ± 0.0002	0 ± 0.00168	0 ± 0.00687
EVANS	01/27/97	06	24	F	2.0676 ± 0.33938	0.96505	0.57332	90.37071	1.38443 ± 0.08592	0.62997 ± 0.13862	0.14372 ± 0.05987	0.0105 ± 0.00421	0 ± 0.00029	0 ± 0.00051	0 ± 0.01743
EVANS	01/28/97	06	24	F	4.90667 ± 0.50446	0.985	0.27906	89.99394	3.72428 ± 0.23114	0.73095 ± 0.16084	0.50747 ± 0.21142	0.0315 ± 0.01262	0 ± 0.00044	0 ± 0.00131	0 ± 0.01085
EVANS	01/29/97	06	24	F	3.18045 ± 0.38471	0.97875	0.32941	103.5719	2.74534 ± 0.17038	0.22611 ± 0.04975	0.2301 ± 0.09586	0.0416 ± 0.01666	0 ± 0.00016	0 ± 0.00053	0 ± 0.00111
EVANS	01/30/97	06	24	F	3.80323 ± 0.42982	0.93072	1.27257	91.4053	3.03884 ± 0.1886	0.56191 ± 0.12364	0.34639 ± 0.14431	0.01124 ± 0.0045	0 ± 0.00025	0 ± 0.0015	0 ± 0.04502
MASTER	12/19/96	06	24	F	1.6244 ± 0.3256	0.98382	0.21832	76.39304	±	1.07125 ± 0.23572	0.14743 ± 0.06142	0.46515 ± 0.1863	0 ± 0.00014	0 ± 0.00049	0 ± 0.00355
MASTER	12/25/96	06	24	F	0.7583 ± 0.2939	0.95852	0.46025	90.84805	±	0.50431 ± 0.11097	±	0.63049 ± 0.25252	0 ± 0.00016	0 ± 0.00034	0 ± 0.00153
MASTER	12/31/96	06	24	F	1.213 ± 0.3009	0.94873	0.67545	62.35867	±	0.81735 ± 0.17985	0.11336 ± 0.04723	0.73671 ± 0.29506	0 ± 0.00006	0 ± 0.00025	0 ± 0.00657
MASTER	01/02/97	06	24	F	2.815 ± 0.3606	0.95168	0.51645	99.87712	±	1.4227 ± 0.31305	0.14756 ± 0.06148	2.14964 ± 0.86095	0 ± 0.00003	0 ± 0.00037	0 ± 0.04109
MASTER	01/06/97	06	24	F	0.9256 ± 0.2748	0.98291	0.22664	97.4642	±	0.63388 ± 0.13948	0.04658 ± 0.01941	0.36396 ± 0.14577	0 ± 0.00008	0 ± 0.00024	±
MASTER	01/07/97	06	24	F	2.0324 ± 0.3212	0.94355	0.50102	80.51696	±	0.78018 ± 0.17167	0.02331 ± 0.00971	2.07686 ± 0.8318	0 ± 0.00005	0 ± 0.00021	0 ± 0.01263
MASTER	01/13/97	06	24	F	3.1826 ± 0.4014	0.98279	0.28705	81.78017	0.58291 ± 0.03618	1.98465 ± 0.4367	0.16961 ± 0.07066	0.50224 ± 0.20115	0 ± 0.00051	0 ± 0.00125	0 ± 0.007
MASTER	01/14/97	06	24	F	1.8594 ± 0.3352	0.98179	0.24104	91.60244	0.05079 ± 0.00315	1.43919 ± 0.31668	0.06303 ± 0.02626	0.34794 ± 0.13935	0 ± 0.00023	0 ± 0.00073	0 ± 0.00171
MASTER	01/15/97	06	24	F	1.2291 ± 0.3115	0.97238	0.24964	96.72958	±	0.89815 ± 0.19763	±	0.31005 ± 0.12418	0 ± 0.00014	0 ± 0.00003	±
MASTER	01/16/97	06	24	F	1.7067 ± 0.3287	0.9744	0.34776	87.00994	±	1.13706 ± 0.2502	0.06728 ± 0.02803	0.75041 ± 0.30055	0 ± 0.00024	0 ± 0.00042	0 ± 0.00492
MASTER	01/17/97	06	24	F	5.6989 ± 0.5648	0.98841	0.2109	88.57611	1.73262 ± 0.10753	2.9187 ± 0.64223	0.34864 ± 0.14525	0.76187 ± 0.30514	0 ± 0.00077	0 ± 0.00206	0 ± 0.01128
MASTER	01/18/97	06	24	F	3.3933 ± 0.4152	0.98978	0.1557	89.2774	1.99975 ± 0.12411	1.08603 ± 0.23897	0.1685 ± 0.0702	0.18553 ± 0.07431	0 ± 0.00026	0 ± 0.00166	0 ± 0.01928
MASTER	01/19/97	06	24	F	4.9765 ± 0.513	0.98825	0.17042	88.34245	2.21003 ± 0.13716	2.26098 ± 0.4975	0.1521 ± 0.06337	0.39844 ± 0.15958	0 ± 0.00025	0 ± 0.00224	0 ± 0.02103
MASTER	01/20/97	06	24	F	4.8032 ± 0.5035	0.98789	0.19858	87.44274	3.56463 ± 0.22123	0.78922 ± 0.17366	0.38195 ± 0.15913	0.14532 ± 0.0582	0 ± 0.00025	0 ± 0.00174	0 ± 0.01453
MASTER	01/27/97	06	24	F	1.434 ± 0.3159	0.9597	0.48062	82.1172	0.70655 ± 0.04385	0.67157 ± 0.14777	0.03617 ± 0.01507	0.11125 ± 0.04456	0 ± 0.00016	0 ± 0.00037	0 ± 0.01899
MASTER	01/28/97	06	24	F	2.8291 ± 0.3825	0.99159	0.1525	95.04123	1.94628 ± 0.12079	0.68618 ± 0.15099	0.17406 ± 0.07252	0.0536 ± 0.02147	0 ± 0.00033	0 ± 0.0011	0 ± 0.01448
MASTER	01/29/97	06	24	F	1.5188 ± 0.3189	0.96255	0.61875	124.941	1.27095 ± 0.07888	0.25813 ± 0.0568	0.04214 ± 0.01756	0.00314 ± 0.00126	0 ± 0.00012	0 ± 0.00033	0 ± 0.02601
MASTER	01/30/97	06	24	F	2.6792 ± 0.3735	0.98843	0.20641	106.4253	2.04413 ± 0.12686	0.45608 ± 0.10036	0.20121 ± 0.08383	0.02712 ± 0.01086	0 ± 0.00023	0 ± 0.00143	0 ± 0.01308

Table C.1B-3
24-Hour Contributions to PM2.5 Mass at Core and Satellite Sites for Individual Samples - NFRAQS Winter 1996/97, Conventional CMB

Site ID	Sample Date	Start Hour	Duration (hrs)	Size	$PM_{2.5}$ ($\mu g/m^3$)	R-square	Chi-square	Percent of Mass	Light-Duty Gasoline Vehicle Exhaust	Diesel Exhaust Diesel Exhaust	Paved Road Dust	Meat Cooking and Wood Combustion	Ammonium Sulfate	Ammonium Nitrate	Coal-Fired Power Plant
BRIGHT	12/18/96	06	24	F	5.9843 ± 0.57004	0.9918	0.1219	117.659	2.26665 ± 0.88071	0.33974 ± 0.68518	1.27131 ± 0.3724	0.57483 ± 0.32799	1.03616 ± 0.12821	1.32873 ± 0.15029	0.22366 ± 0.36826
BRIGHT	12/19/96	06	24	F	14.12272 ± 0.98405	0.98882	0.14971	92.21834	3.51614 ± 1.61259	0.8788 ± 1.3858	1.75951 ± 0.47376	0.62075 ± 0.23556	1.73519 ± 0.26974	4.51335 ± 0.47881	± 0
BRIGHT	12/25/96	06	24	F	5.9469 ± 0.59207	0.98823	0.13271	110.0184	0.0565 ± 0.91258	0.75771 ± 0.77301	0.15291 ± 0.28964	0.39609 ± 0.23892	1.45895 ± 0.21981	3.56009 ± 0.37553	0.16043 ± 0.2741
BRIGHT	12/26/96	06	24	F	9.8453 ± 0.71043	0.98415	0.22945	105.0126	0.08304 ± 1.35553	1.14447 ± 1.20112	0.48278 ± 0.31395	1.04634 ± 0.45217	2.2558 ± 0.29066	5.01614 ± 0.48886	0.31024 ± 0.44947
BRIGHT	12/30/96	06	24	F	4.41787 ± 0.52184	0.96654	0.31062	107.8098	1.07938 ± 0.95787	0.45322 ± 0.79441	1.04137 ± 0.31904	0.91072 ± 0.40242	0.48296 ± 0.08681	0.41947 ± 0.07003	0.37578 ± 0.40923
BRIGHT	12/31/96	06	24	F	6.44998 ± 0.59642	0.95806	0.54679	118.4375	1.36649 ± 1.67368	1.18962 ± 1.50327	1.51889 ± 0.40564	0.96467 ± 0.44718	0.48578 ± 0.11354	1.53896 ± 0.17108	0.57478 ± 0.45934
BRIGHT	01/02/97	06	24	F	5.20452 ± 0.54704	0.97534	0.22823	135.4146	0.97007 ± 1.86398	1.40986 ± 1.67417	1.31874 ± 0.38544	1.90279 ± 0.64132	0.39635 ± 0.10427	0.74991 ± 0.10933	0.29998 ± 0.49881
BRIGHT	01/06/97	06	24	F	6.25895 ± 0.57368	0.98876	0.15218	102.2595	1.16819 ± 0.87224	0.4525 ± 0.71489	0.93165 ± 0.32214	0.14693 ± 0.16961	0.7685 ± 0.10518	2.79584 ± 0.26345	0.13676 ± 0.22701
BRIGHT	01/07/97	06	24	F	9.22488 ± 0.69799	0.98856	0.17359	106.4701	1.7989 ± 1.05554	0.37979 ± 0.89541	1.25717 ± 0.36884	1.48572 ± 0.57017	0.92418 ± 0.13725	3.81489 ± 0.35486	0.16108 ± 0.51978
BRIGHT	01/12/97	06	24	F	8.1684 ± 0.6608	0.955	0.60683	85.98517	1.061 ± 1.25857	0.92341 ± 1.10514	0.43795 ± 0.30571	0.53474 ± 0.31124	1.14945 ± 0.18875	2.35185 ± 0.26509	0.56522 ± 0.356
BRIGHT	01/13/97	06	24	F	20.32605 ± 1.13602	0.98847	0.19441	91.7846	3.56503 ± 2.09484	1.29584 ± 1.8854	1.15906 ± 0.40997	0.52414 ± 0.40452	2.92026 ± 0.40538	8.85768 ± 0.82331	0.33417 ± 0.46625
BRIGHT	01/14/97	06	24	F	19.98918 ± 1.14677	0.98902	0.18011	89.94721	4.15305 ± 1.63605	0.896 ± 1.40822	1.35696 ± 0.43068	0.40715 ± 0.21732	4.33659 ± 0.50854	6.82995 ± 0.71198	± 0
BRIGHT	01/15/97	06	24	F	7.04987 ± 0.61065	0.9852	0.2198	85.70633	1.1372 ± 0.90964	0.52093 ± 0.76879	0.25182 ± 0.28629	0.49463 ± 0.29109	1.74667 ± 0.18874	1.62072 ± 0.18611	0.27021 ± 0.33032
BRIGHT	01/16/97	06	24	F	13.13058 ± 0.84016	0.97924	0.37286	90.97844	2.50106 ± 1.389	0.75337 ± 1.21317	1.14471 ± 0.36544	0.70373 ± 0.39676	2.21894 ± 0.26565	4.10405 ± 0.41763	0.52013 ± 0.43688
BRIGHT	01/17/97	06	24	F	26.95628 ± 1.44141	0.97421	0.44112	94.03374	4.79313 ± 1.67543	0.66771 ± 1.38104	3.01443 ± 0.66086	1.76939 ± 0.518	3.5105 ± 0.46529	11.59283 ± 1.06846	± 0
BRIGHT	01/18/97	06	24	F	7.34632 ± 0.59959	0.98944	0.14858	116.6143	2.54207 ± 1.06675	0.48784 ± 0.87103	1.47028 ± 0.39379	0.39074 ± 0.26917	0.42468 ± 0.07967	3.1756 ± 0.28669	0.07565 ± 0.32081
BRIGHT	01/19/97	06	24	F	13.4601 ± 0.92227	0.98722	0.18982	98.87736	3.23104 ± 1.21528	0.55772 ± 1.01127	1.17588 ± 0.38001	0.46024 ± 0.33297	0.92918 ± 0.13474	6.89045 ± 0.6297	0.06448 ± 0.38761
BRIGHT	01/27/97	06	24	F	8.51748 ± 0.65053	0.98881	0.17027	96.1968	1.17812 ± 1.19209	0.84491 ± 1.05459	0.8218 ± 0.33402	0.2337 ± 0.20173	1.48885 ± 0.17738	3.47548 ± 0.33788	0.15068 ± 0.26208
BRIGHT	01/29/97	06	24	F	5.4749 ± 0.55331	0.98755	0.17522	107.8725	1.75188 ± 0.81693	0.35613 ± 0.64421	0.53911 ± 0.32289	0.21797 ± 0.20864	1.14377 ± 0.13632	1.74068 ± 0.18874	0.15637 ± 0.26611
BRIGHT	01/30/97	06	24	F	3.32708 ± 0.51244	0.94924	0.38334	142.3274	2.04961 ± 0.85989	0.35006 ± 0.66255	0.75447 ± 0.34194	0.44015 ± 0.27064	0.18225 ± 0.07407	0.57812 ± 0.08599	0.38068 ± 0.31987
LONGMO	12/18/96	06	24	F	9.4289 ± 0.7584	0.98962	0.17894	93.68561	1.68827 ± 1.62211	1.04301 ± 1.44289	1.45017 ± 0.34987	1.33439 ± 0.50545	1.15106 ± 0.1425	1.9155 ± 0.18802	0.2511 ± 0.41865
LONGMO	12/19/96	06	24	F	12.866 ± 0.8707	0.9759	0.44234	98.54799	2.90035 ± 1.71313	0.97975 ± 1.51638	1.56788 ± 0.39078	0.79019 ± 0.41512	1.18046 ± 0.17681	4.54244 ± 0.39578	0.71811 ± 0.43993
LONGMO	12/25/96	06	24	F	7.9383 ± 0.6924	0.95974	0.6003	77.26418	0.13796 ± 0.94301	0.73547 ± 0.79567	0.04731 ± 0.20953	0.69875 ± 0.28546	0.83888 ± 0.11547	3.39349 ± 0.2889	0.28161 ± 0.27227
LONGMO	12/26/96	06	24	F	15.0999 ± 0.9416	0.98376	0.25537	98.24805	± 0	1.26269 ± 0.55755	0.55047 ± 0.24793	3.46331 ± 0.9166	3.19932 ± 0.37854	6.08822 ± 0.56414	0.27134 ± 0.57424
LONGMO	01/06/97	06	24	F	7.2866 ± 0.6633	0.98952	0.16828	113.6065	2.18206 ± 1.30513	0.75148 ± 1.1404	0.76853 ± 0.25633	0.25532 ± 0.24035	0.73037 ± 0.11371	3.16144 ± 0.27704	0.42886 ± 0.30641
LONGMO	01/07/97	06	24	F	7.5776 ± 0.679	0.96592	0.46705	115.7217	± 0	1.296 ± 0.54406	0.86214 ± 0.27163	3.1778 ± 0.8563	0.50178 ± 0.12056	2.39913 ± 0.2113	0.53209 ± 0.51616
LONGMO	01/13/97	06	24	F	16.0326 ± 0.9783	0.98743	0.1954	96.19735	2.26296 ± 1.95157	1.4484 ± 1.77143	1.20771 ± 0.34708	0.25063 ± 0.30069	2.29903 ± 0.36086	7.49638 ± 0.67953	0.45782 ± 0.38639
LONGMO	01/14/97	06	24	F	30.1186 ± 1.6098	0.99211	0.14891	94.56229	4.60422 ± 2.68865	1.68924 ± 2.43137	1.31137 ± 0.43913	0.64319 ± 0.53592	5.64621 ± 0.68486	14.07327 ± 1.25704	0.51333 ± 0.61532
LONGMO	01/15/97	06	24	F	7.3822 ± 0.6657	0.98202	0.30986	107.7938	1.28173 ± 1.01412	0.54877 ± 0.86169	0.92762 ± 0.24749	0.47287 ± 0.28999	1.89564 ± 0.21242	2.62289 ± 0.25804	0.20804 ± 0.33595
LONGMO	01/16/97	06	24	F	22.2438 ± 1.2486	0.9899	0.17696	80.86354	3.53034 ± 2.06441	1.22807 ± 1.84587	1.31286 ± 0.38086	0.87304 ± 0.50567	3.17642 ± 0.43212	7.32939 ± 0.68648	0.53701 ± 0.54615
LONGMO	01/17/97	06	24	F	31.5126 ± 1.6747	0.99048	0.17535	93.60557	4.61292 ± 2.42269	1.38869 ± 2.16192	2.21907 ± 0.54203	0.75784 ± 0.50748	3.03741 ± 0.46516	16.44052 ± 1.37213	1.0411 ± 0.62558
LONGMO	01/18/97	06	24	F	18.479 ± 1.0824	0.99117	0.14914	92.57707	3.21782 ± 1.90112	1.13202 ± 1.69896	1.38083 ± 0.37519	0.71415 ± 0.42105	0.9823 ± 0.1411	9.52274 ± 0.79694	0.15746 ± 0.47816
LONGMO	01/19/97	06	24	F	15.0562 ± 0.9467	0.98951	0.17283	120.5118	3.70899 ± 1.58052	0.80242 ± 1.37239	0.85305 ± 0.31161	0.63887 ± 0.41105	0.78461 ± 0.12082	11.34046 ± 0.93133	0.0161 ± 0.48435
LONGMO	01/20/97	06	24	F	11.1948 ± 0.8191	0.98845	0.18996	110.6792	2.35243 ± 0.98312	0.31998 ± 0.74095	2.76443 ± 0.53768	0.81283 ± 0.42996	0.64889 ± 0.11009	5.25395 ± 0.43562	0.23781 ± 0.45244
LONGMO	01/27/97	06	24	F	11.5918 ± 0.8045	0.97735	0.36595	88.72358	1.02379 ± 1.16243	0.83746 ± 1.02844	0.71073 ± 0.22926	0.299 ± 0.25619	1.82986 ± 0.23906	5.38927 ± 0.47161	0.19453 ± 0.30419
LONGMO	01/28/97	06	24	F	20.6506 ± 1.1861	0.98397	0.26647	88.54654	2.88786 ± 1.17482	0.42814 ± 0.93721	2.86656 ± 0.56722	1.04168 ± 0.53475	2.85418 ± 0.4052	8.04555 ± 0.73345	0.16141 ± 0.55978
LONGMO	01/29/97	06	24	F	11.581 ± 0.8106	0.98115	0.31904	93.4498	2.26904 ± 0.82886	0.31396 ± 0.62901	0.97942 ± 0.26804	0.31993 ± 0.28416	1.778 ± 0.234	4.95094 ± 0.43964	0.21112 ± 0.33508
LONGMO	01/30/97	06	24	F	20.8308 ± 1.1848	0.97226	0.4463	47.59289	1.32631 ± 0.92638	0.41035 ± 0.75188	1.1074 ± 0.27689	0.66566 ± 0.36616	0.7531 ± 0.13651	5.01229 ± 0.41572	0.63887 ± 0.41626
FTCOLL	12/18/96	06	24	F	11.5232 ± 0.8226	0.92663	1.02211	110.0238	1.14279 ± 1.83903	1.00803 ± 1.63304	0.54646 ± 0.26549	7.29663 ± 1.64011	0.77942 ± 0.15655	1.09076 ± 0.13055	0.81416 ± 0.81213
FTCOLL	12/19/96	06	24	F	15.531 ± 0.9631	0.97275	0.48621	99.85317	3.08821 ± 2.39659	1.30447 ± 2.16537	2.27131 ± 0.51141	3.52325 ± 1.05556	1.14044 ± 0.16798	4.1101 ± 0.37262	0.07042 ± 0.64478
FTCOLL	12/25/96	06	24	F	6.4685 ± 0.6644	0.9837	0.2405	120.0478	1.54666 ± 0.95755	0.42001 ± 0.80405	0.07462 ± 0.17885	1.11876 ± 0.46146	1.24829 ± 0.1581	3.23268 ± 0.30171	0.12427 ± 0.44254
FTCOLL	12/26/96	06	24	F	21.0678 ± 1.1978	0.98751	0.22401	106.0439	1.38205 ± 3.42417	2.81393 ± 3.11843	1.56897 ± 0.49306	6.5502 ± 1.66158	3.09542 ± 0.39025	6.55208 ± 0.60506	0.37846 ± 0.91488
FTCOLL	12/30/96	06	24	F	13.7804 ± 0.8943	0.97151	0.39489	122.251	5.15502 ± 0.98831	± 0	3.90363 ± 0.78301	4.8338 ± 1.24748	0.42315 ± 0.13475	2.25802 ± 0.22297	0.27305 ± 0.74535
FTCOLL	12/31/96	06	24	F	18.4725 ± 1.0865	0.96784	0.43073	105.0524	3.92273 ± 4.20496	2.9674 ± 3.84499	3.496 ± 0.79632	6.07001 ± 1.6858	0.27137 ± 0.16209	2.07654 ± 0.21045	0.60175 ± 0.89531
FTCOLL	01/01/97	06	24	F	11.647 ± 0.8213	0.9737	0.38161	105.942	3.09172 ± 2.81174	2.12641 ± 2.55998	1.71584 ± 0.4744	2.29376 ± 0.78904	0.26462 ± 0.09939	2.7573 ± 0.24759	0.08939 ± 0.58625
FTCOLL	01/02/97	06	24	F	9.1455 ± 0.7256	0.92817	0.82221	110.8447	0.90909 ± 2.31744	1.70115 ± 2.09902	1.83436 ± 0.43186	3.7263 ± 1.0329	0.12483 ± 0.11471	1.22368 ± 0.13279	0.61788 ± 0.60127
FTCOLL	01/06/97	06	24	F	9.1524 ± 0.7311	0.97973	0.28115	91.64814	1.22526 ± 1.56708	0.95336 ± 1.38903	0.95421 ± 0.27315	3.17474 ± 0.7068	0.49579 ± 0.07698	1.58465 ± 0.14951	± 0
FTCOLL	01/07/97	06	24	F	12.5983 ± 0.8515	0.95386	0.6025	93.44357	1.2278 ± 1.99245	1.14713 ± 1.7919	0.94377 ± 0.30319	6.4416 ± 1.56966	0.40984 ± 0.13001	1.37501 ± 0.14485	0.22715 ± 0.75699
FTCOLL	01/12/97	06	24	F	7.5513 ± 0.6897	0.96419	0.55485	84.19773	0.22282 ± 1.5169	1.28436 ± 1.34512	0.326 ± 0.22315	1.72169 ± 0.5357	1.09718 ± 0.13194	1.49568 ± 0.15307	0.2103 ± 0.38348
FTCOLL	01/13/97	06	24	F	10.9683 ± 0.7985	0.98439	0.25643	91.72906	1.61612 ± 1.48984	0.96898 ± 1.31848	0.8433 ± 0.26648	0.96333 ± 0.45165	1.25933 ± 0.16328	4.23374 ± 0.37804	0.17632 ± 0.46334
FTCOLL	01/14/97	06	24	F	26.6489 ± 1.4546	0.98588	0.24047	88.40793	3.6995 ± 2.46603	1.50157 ± 2.22714	1.36028 ± 0.40824	2.20224 ± 0.87859	2.40381 ± 0.39207	12.29996 ± 1.03242	0.09238 ± 0.80377
FTCOLL	01/15/97	06	24	F	9.8286 ± 0.7551	0.97464	0.42815	99.23792	2.02225 ± 1.16663	0.60481 ± 0.99283	0.64352 ± 0.24299	0.4021 ± 0.31884	1.72736 ± 0.24728	3.40803 ± 0.33134	0.94563 ± 0.40065
FTCOLL	01/16/97	06	24	F	19.9972 ± 1.1476	0.98921	0.19074	84.63582	2.94848 ± 2.03717	1.29445 ± 1.83079	1.52637 ± 0.39914	0.69318 ± 0.45124	2.74756 ± 0.39894	7.0591 ± 0.64619	0.65565 ± 0.5083
FTCOLL	01/17/97	06	24	F	19.6216 ± 1.1333	0.98815	0.20442	98.62191	4.65101 ± 1.87868	0.92417 ± 1.61277	2.65229 ± 0.5869	0.94942 ± 0.53014	1.9889 ± 0.34715	7.90269 ± 0.69018	0.28271 ± 0.56279
FTCOLL	01/18/97	06	24	F	18.9735 ± 1.1033	0.96719	0.56913	97.50018	4.43041 ± 2.86096	1.91531 ± 2.57973	2.10444 ± 0.54074	1.64091 ± 0.49062	0.79226 ± 0.10837	7.61586 ± 0.62435	± 0

Table C.1B-3 (continued)
24-Hour Contributions to PM2.5 Mass at Core and Satellite Sites for Individual Samples - NFRAQS Winter 1996/97, Conventional CMB

Site ID	Sample Date	Start Hour	Duration (hrs)	Size	$PM_{2.5}$ ($\mu g/m^3$)	R-square	Chi-square	Percent of Mass	Light-Duty Gasoline Vehicle Exhaust	Diesel Exhaust Diesel Exhaust	Paved Road Dust	Meat Cooking and Wood Combustion	Ammonium Sulfate	Ammonium Nitrate	Coal-Fired Power Plant
FTCOLL	01/19/97	06	24	F	12.7729 ± 0.8529	0.97817	0.32126	93.78861	4.80394 ± 2.12938	1.2614 ± 1.88059	1.50608 ± 0.43965	0.63586 ± 0.2694	0.34213 ± 0.06141	3.43012 ± 0.30316	± 0
FTCOLL	01/20/97	06	24	F	15.7425 ± 0.9682	0.98182	0.30262	106.2038	5.45976 ± 1.5047	0.52983 ± 1.17506	2.84732 ± 0.62461	1.54519 ± 0.47868	0.54834 ± 0.08368	5.78869 ± 0.48153	± 0
FTCOLL	01/27/97	06	24	F	14.7328 ± 0.9337	0.98598	0.24124	93.5173	1.6951 ± 1.20918	0.70054 ± 1.05262	1.20521 ± 0.29835	0.07512 ± 0.25315	2.78131 ± 0.33585	7.05671 ± 0.62273	0.26374 ± 0.3191
FTCOLL	01/29/97	06	24	F	18.8711 ± 1.0989	0.98593	0.24241	94.7873	2.66962 ± 1.11451	0.50043 ± 0.90026	1.9531 ± 0.42063	0.16827 ± 0.29464	1.87638 ± 0.2603	10.25454 ± 0.84591	0.46507 ± 0.36936
FTCOLL	01/30/97	06	24	F	17.408 ± 1.0381	0.97393	0.44589	102.6004	4.07415 ± 0.73885	± 0	1.85546 ± 0.43986	3.27528 ± 0.90969	0.8459 ± 0.15342	7.47596 ± 0.61445	0.33393 ± 0.67997
EVANS	12/18/96	06	24	F	5.7815 ± 0.5454	0.96393	0.53158	97.59219	0.93524 ± 1.29848	1.06538 ± 1.16289	0.55121 ± 0.30131	0.4259 ± 0.27359	0.93055 ± 0.13225	0.88283 ± 0.11014	0.85119 ± 0.33551
EVANS	12/19/96	06	24	F	19.56848 ± 1.08943	0.98589	0.23648	88.45834	1.31612 ± 2.97464	2.50601 ± 2.71247	2.15573 ± 0.55665	3.06709 ± 0.97609	2.00292 ± 0.26559	6.08844 ± 0.56428	0.17365 ± 0.68863
EVANS	01/07/97	06	24	F	10.46355 ± 0.75338	0.98428	0.21522	95.91374	0.51655 ± 2.2838	2.03873 ± 2.07159	0.65741 ± 0.36412	3.43832 ± 0.95347	0.7465 ± 0.12906	2.4071 ± 0.24205	0.23137 ± 0.5461
EVANS	01/13/97	06	24	F	16.11312 ± 0.93591	0.97646	0.42592	97.27538	2.4693 ± 1.91459	1.33317 ± 1.73062	0.68931 ± 0.33985	0.93284 ± 0.48653	2.84901 ± 0.36427	6.62717 ± 0.63395	0.7733 ± 0.51519
EVANS	01/14/97	06	24	F	32.67363 ± 1.74677	0.98366	0.31031	94.20854	4.48309 ± 1.762	0.81584 ± 1.53903	1.20642 ± 0.421	1.45691 ± 0.75498	7.25797 ± 0.83322	15.33312 ± 1.46379	0.22799 ± 0.78877
EVANS	01/15/97	06	24	F	11.23798 ± 0.8674	0.95543	0.73735	101.1532	2.27989 ± 1.21515	0.64787 ± 1.03979	0.45892 ± 0.32336	0.31649 ± 0.27826	3.1213 ± 0.36919	3.63812 ± 0.42364	0.90498 ± 0.37387
EVANS	01/16/97	06	24	F	18.68992 ± 1.07692	0.97972	0.37555	85.73607	3.1927 ± 1.64657	0.89204 ± 1.45553	1.1831 ± 0.38624	0.87355 ± 0.47754	3.47214 ± 0.41844	5.61164 ± 0.58823	0.79883 ± 0.51441
EVANS	01/17/97	06	24	F	42.9227 ± 2.20014	0.98456	0.30133	90.5602	6.87561 ± 2.73035	1.31217 ± 2.39734	2.82041 ± 0.70931	2.09973 ± 1.01115	5.82617 ± 0.73819	19.10326 ± 1.73391	0.83353 ± 1.02548
EVANS	01/18/97	06	24	F	36.75805 ± 1.93584	0.98571	0.25087	98.33311	6.12991 ± 2.86209	1.6715 ± 2.54117	2.54543 ± 0.65277	1.20501 ± 0.42906	3.52169 ± 0.4208	21.0718 ± 1.8269	± 0
EVANS	01/19/97	06	24	F	27.84452 ± 1.50785	0.98906	0.19612	95.45865	5.41816 ± 1.90644	0.93385 ± 1.63965	1.69033 ± 0.49824	0.5721 ± 0.43223	2.00031 ± 0.25414	15.7701 ± 1.35285	0.19517 ± 0.51509
EVANS	01/20/97	06	24	F	34.73692 ± 1.89509	0.97123	0.53447	94.7924	7.33462 ± 2.34162	1.0133 ± 1.96366	3.93548 ± 0.87132	1.60106 ± 0.84239	2.01935 ± 0.27828	16.78926 ± 1.45629	0.2349 ± 0.86507
EVANS	01/27/97	06	24	F	13.49895 ± 0.86484	0.96505	0.57332	90.37071	1.92834 ± 1.3282	0.82109 ± 1.17145	0.75925 ± 0.3282	0.11054 ± 0.23754	2.87867 ± 0.35395	5.10547 ± 0.5255	0.59574 ± 0.32944
EVANS	01/28/97	06	24	F	30.04302 ± 1.64084	0.985	0.27906	89.99394	5.18744 ± 1.92378	0.95269 ± 1.64141	2.68091 ± 0.62786	0.33157 ± 0.48073	4.44724 ± 0.53208	13.0664 ± 1.22099	0.37064 ± 0.5271
EVANS	01/29/97	06	24	F	12.2636 ± 0.80926	0.97875	0.32941	103.5719	3.8239 ± 0.90732	0.2947 ± 0.63717	1.21562 ± 0.38842	0.43788 ± 0.32283	1.57957 ± 0.22832	5.31214 ± 0.50545	0.03783 ± 0.37259
EVANS	01/30/97	06	24	F	28.36583 ± 1.60944	0.93072	1.27257	91.4053	4.23271 ± 1.53978	0.73238 ± 1.2961	1.82995 ± 0.48901	0.11827 ± 0.38206	2.4703 ± 0.37868	15.00579 ± 1.34965	1.53846 ± 0.56168
MASTER	12/19/96	06	24	F	17.6065 ± 1.0469	0.98382	0.21832	76.39304	± 0	1.39623 ± 0.60273	0.77888 ± 0.27521	4.89606 ± 1.24496	1.38001 ± 0.19344	4.8777 ± 0.45058	0.12127 ± 0.64107
MASTER	12/25/96	06	24	F	13.5663 ± 0.8878	0.95852	0.46025	90.84805	± 0	0.6573 ± 0.45869	± 0	6.63646 ± 1.39819	1.61163 ± 0.23829	3.36715 ± 0.33952	0.05218 ± 0.61545
MASTER	12/31/96	06	24	F	20.426 ± 1.1648	0.94873	0.67545	62.35867	± 0	1.06531 ± 0.6279	0.5989 ± 0.25294	7.75449 ± 1.75682	0.60216 ± 0.15227	2.49188 ± 0.23094	0.22465 ± 0.7403
MASTER	01/02/97	06	24	F	30.7782 ± 1.6368	0.95168	0.51645	99.87712	± 0	1.8543 ± 1.33497	0.77955 ± 0.45854	22.6268 ± 4.44875	0.34863 ± 0.33729	3.72686 ± 0.37887	1.40423 ± 1.63618
MASTER	01/06/97	06	24	F	8.341 ± 0.698	0.98291	0.22664	97.4642	± 0	0.82618 ± 0.44132	0.24608 ± 0.17636	3.83104 ± 0.83841	0.84044 ± 0.11136	2.38575 ± 0.21612	± 0
MASTER	01/07/97	06	24	F	32.3464 ± 1.7119	0.94355	0.50102	80.51696	± 0	1.01687 ± 1.11507	0.12316 ± 0.36286	21.86074 ± 4.23775	0.53528 ± 0.26931	2.07658 ± 0.2487	0.4317 ± 1.46879
MASTER	01/13/97	06	24	F	33.5675 ± 1.7692	0.98279	0.28705	81.78017	0.81191 ± 2.99532	2.58674 ± 2.72564	0.89602 ± 0.39365	5.28656 ± 1.47728	5.14784 ± 0.63524	12.48334 ± 1.12294	0.23914 ± 0.904
MASTER	01/14/97	06	24	F	17.0211 ± 1.0186	0.98179	0.24104	91.60244	0.07074 ± 2.16434	1.87581 ± 1.95228	0.33296 ± 0.2759	3.66233 ± 0.95115	2.27954 ± 0.36469	7.31206 ± 0.66734	0.0583 ± 0.57379
MASTER	01/15/97	06	24	F	6.3715 ± 0.6517	0.97238	0.24964	96.72958	± 0	1.17063 ± 0.45568	± 0	3.26354 ± 0.70777	1.43167 ± 0.13456	0.29728 ± 0.06375	± 0
MASTER	01/16/97	06	24	F	18.9751 ± 1.0984	0.9744	0.34776	87.00994	± 0	1.48201 ± 0.69495	0.35543 ± 0.26775	7.89869 ± 1.71261	2.41314 ± 0.31522	4.19273 ± 0.41754	0.16822 ± 0.78204
MASTER	01/17/97	06	24	F	50.5198 ± 2.5872	0.98841	0.2109	88.57611	2.41332 ± 4.61703	3.80416 ± 4.21705	1.84185 ± 0.62526	8.01938 ± 2.1716	7.65788 ± 0.92146	20.62645 ± 1.81024	0.38544 ± 1.41573
MASTER	01/18/97	06	24	F	30.151 ± 1.6033	0.98978	0.1557	89.2774	2.78539 ± 2.19306	1.4155 ± 1.9815	0.89019 ± 0.33041	1.95287 ± 0.83785	2.614 ± 0.58383	16.60113 ± 1.40047	0.65895 ± 0.82495
MASTER	01/19/97	06	24	F	41.4184 ± 2.161	0.98825	0.17042	88.34245	3.07829 ± 3.67722	2.9469 ± 3.35758	0.80354 ± 0.45471	4.19391 ± 1.44234	2.48199 ± 0.59523	22.36682 ± 1.8372	0.71858 ± 1.21024
MASTER	01/20/97	06	24	F	34.2596 ± 1.7977	0.98789	0.19858	87.44274	4.96507 ± 2.117	1.02865 ± 1.85832	2.01783 ± 0.51026	1.5296 ± 0.78054	2.54456 ± 0.57709	17.37521 ± 1.461	0.49662 ± 0.82902
MASTER	01/27/97	06	24	F	11.1716 ± 0.7866	0.9597	0.48062	82.1172	0.98414 ± 1.23596	0.87531 ± 1.08217	0.19106 ± 0.19637	1.17102 ± 0.49554	1.57069 ± 0.3022	3.73261 ± 0.38858	0.64898 ± 0.48619
MASTER	01/28/97	06	24	F	20.9531 ± 1.1848	0.99159	0.1525	95.04123	2.71091 ± 1.56567	0.89434 ± 1.38197	0.91955 ± 0.29695	0.56422 ± 0.41681	3.29992 ± 0.39128	11.03017 ± 0.95527	0.49497 ± 0.4758
MASTER	01/29/97	06	24	F	6.2064 ± 0.6348	0.96255	0.61875	124.941	1.77027 ± 0.79408	0.33644 ± 0.6119	0.22263 ± 0.18814	0.03305 ± 0.20056	1.20671 ± 0.17796	3.29643 ± 0.29688	0.88881 ± 0.28678
MASTER	01/30/97	06	24	F	20.5315 ± 1.1664	0.98843	0.20641	106.4253	2.84721 ± 1.22939	0.59444 ± 1.0339	1.06296 ± 0.3042	0.28549 ± 0.3291	2.30471 ± 0.28447	14.30878 ± 1.1652	0.44711 ± 0.41098

Table C.1B-4
24-Hour Contributions to Elemental Carbon at Core and Satellite Sites for Individual Samples - NFRAQS Winter 1996/97, Conventional CMB

Site ID	Sample Date	Start Hour	Duration (hrs)	Size	Elemental Carbon (µg/m^3)	R-square	Chi-square	Percent of Mass	Light-Duty Gasoline Vehicle Exhaust	Diesel Exhaust Diesel Exhaust	Paved Road Dust	Meat Cooking and Wood Combustion	Ammonium Sulfate	Ammonium Nitrate	Coal-Fired Power Plant
BRIGHT	12/18/96	06	24	F	1.25517 ± 0.21581	0.9918	0.1219	117.659	0.25069 ± 0.06773	0.03932 ± 0.0254	0.95346 ± 0.13052	0.00443 ± 0.0051	0 ± 0.0001	0 ± 0.00013	0.00956 ± 0.00692
BRIGHT	12/19/96	06	24	F	1.81588 ± 0.25067	0.98882	0.14971	92.21834	0.38888 ± 0.10506	0.10171 ± 0.06569	1.31961 ± 0.18065	0.00478 ± 0.00551	0 ± 0.00017	0 ± 0.00045	±
BRIGHT	12/25/96	06	24	F	0.2219 ± 0.19434	0.98823	0.13271	110.0184	0.00625 ± 0.00169	0.0877 ± 0.05664	0.11468 ± 0.0157	0.00305 ± 0.00351	0 ± 0.00015	0 ± 0.00036	0.00686 ± 0.00496
BRIGHT	12/26/96	06	24	F	0.5293 ± 0.19538	0.98415	0.22945	105.0126	0.00918 ± 0.00248	0.13246 ± 0.08555	0.36208 ± 0.04957	0.00806 ± 0.00929	0 ± 0.00023	0 ± 0.0005	0.01327 ± 0.0096
BRIGHT	12/30/96	06	24	F	0.98118 ± 0.19	0.96654	0.31062	107.8098	0.11938 ± 0.03225	0.05246 ± 0.03388	0.78101 ± 0.10692	0.00702 ± 0.00808	0 ± 0.00005	0 ± 0.00004	0.01607 ± 0.01162
BRIGHT	12/31/96	06	24	F	1.4698 ± 0.21733	0.95806	0.54679	118.4375	0.15113 ± 0.04083	0.13769 ± 0.08892	1.13914 ± 0.15594	0.00743 ± 0.00856	0 ± 0.00005	0 ± 0.00015	0.02458 ± 0.01778
BRIGHT	01/02/97	06	24	F	1.2902 ± 0.20476	0.97534	0.22823	135.4146	0.10729 ± 0.02898	0.16318 ± 0.10538	0.98903 ± 0.13539	0.01466 ± 0.01689	0 ± 0.00004	0 ± 0.00007	0.01283 ± 0.00928
BRIGHT	01/06/97	06	24	F	0.8958 ± 0.20023	0.98876	0.15218	102.2595	0.1292 ± 0.0349	0.05237 ± 0.03382	0.69872 ± 0.09565	0.00113 ± 0.0013	0 ± 0.00008	0 ± 0.00028	0.00585 ± 0.00423
BRIGHT	01/07/97	06	24	F	1.20895 ± 0.21584	0.98856	0.17359	106.4701	0.19895 ± 0.05375	0.04396 ± 0.02839	0.94286 ± 0.12907	0.01145 ± 0.01318	0 ± 0.00009	0 ± 0.00038	0.00689 ± 0.00498
BRIGHT	01/12/97	06	24	F	0.5887 ± 0.19279	0.955	0.60683	85.98517	0.11734 ± 0.0317	0.10688 ± 0.06902	0.32846 ± 0.04496	0.00412 ± 0.00475	0 ± 0.00011	0 ± 0.00024	0.02417 ± 0.01748
BRIGHT	01/13/97	06	24	F	1.43617 ± 0.21491	0.98847	0.19441	91.7846	0.39428 ± 0.10652	0.14998 ± 0.09686	0.86927 ± 0.119	0.00404 ± 0.00465	0 ± 0.00029	0 ± 0.00089	0.01429 ± 0.01034
BRIGHT	01/14/97	06	24	F	1.5878 ± 0.22603	0.98902	0.18011	89.94721	0.45932 ± 0.12409	0.1037 ± 0.06697	1.0177 ± 0.13932	0.00314 ± 0.00361	0 ± 0.00043	0 ± 0.00068	±
BRIGHT	01/15/97	06	24	F	0.39285 ± 0.19219	0.9852	0.2198	85.70633	0.12577 ± 0.03398	0.06029 ± 0.03894	0.18886 ± 0.02585	0.00381 ± 0.00439	0 ± 0.00017	0 ± 0.00016	0.01156 ± 0.00836
BRIGHT	01/16/97	06	24	F	1.25365 ± 0.20649	0.97924	0.37286	90.97844	0.27661 ± 0.07473	0.0872 ± 0.05631	0.85851 ± 0.11753	0.00542 ± 0.00624	0 ± 0.00022	0 ± 0.00041	0.02224 ± 0.01609
BRIGHT	01/17/97	06	24	F	2.8813 ± 0.31605	0.97421	0.44112	94.03374	0.53011 ± 0.14321	0.07728 ± 0.04991	2.26077 ± 0.30949	0.01364 ± 0.0157	0 ± 0.00035	0 ± 0.00116	±
BRIGHT	01/18/97	06	24	F	1.4482 ± 0.21723	0.98944	0.14858	116.6143	0.28115 ± 0.07595	0.05646 ± 0.03647	1.10269 ± 0.15095	0.00301 ± 0.00347	0 ± 0.00004	0 ± 0.00032	0.00323 ± 0.00234
BRIGHT	01/19/97	06	24	F	1.31325 ± 0.2126	0.98722	0.18982	98.87736	0.35735 ± 0.09654	0.06455 ± 0.04169	0.88189 ± 0.12073	0.00355 ± 0.00408	0 ± 0.00009	0 ± 0.00069	0.00276 ± 0.00199
BRIGHT	01/27/97	06	24	F	0.85875 ± 0.20711	0.98881	0.17027	96.1968	0.1303 ± 0.0352	0.09779 ± 0.06316	0.61634 ± 0.08437	0.0018 ± 0.00207	0 ± 0.00015	0 ± 0.00035	0.00644 ± 0.00466
BRIGHT	01/29/97	06	24	F	0.6506 ± 0.21272	0.98755	0.17522	107.8725	0.19375 ± 0.05234	0.04122 ± 0.02662	0.40432 ± 0.05535	0.00168 ± 0.00193	0 ± 0.00011	0 ± 0.00017	0.00669 ± 0.00484
BRIGHT	01/30/97	06	24	F	0.85282 ± 0.21713	0.94924	0.38334	142.3274	0.22668 ± 0.06124	0.04052 ± 0.02617	0.56584 ± 0.07746	0.00339 ± 0.00391	0 ± 0.00002	0 ± 0.00006	0.01628 ± 0.01177
LONGMO	12/18/96	06	24	F	1.4196 ± 0.1678	0.98962	0.17894	93.68561	0.18672 ± 0.05044	0.12072 ± 0.07796	1.0876 ± 0.14889	0.01028 ± 0.01184	0 ± 0.00012	0 ± 0.00019	0.01074 ± 0.00777
LONGMO	12/19/96	06	24	F	1.6517 ± 0.1863	0.9759	0.44234	98.54799	0.32077 ± 0.08666	0.1134 ± 0.07323	1.17588 ± 0.16097	0.00609 ± 0.00701	0 ± 0.00012	0 ± 0.00045	0.03071 ± 0.02221
LONGMO	12/25/96	06	24	F	0.1566 ± 0.1316	0.95974	0.6003	77.26418	0.01526 ± 0.00412	0.08512 ± 0.05497	0.03548 ± 0.00486	0.00539 ± 0.0062	0 ± 0.00008	0 ± 0.00034	0.01204 ± 0.00871
LONGMO	12/26/96	06	24	F	0.6 ± 0.1214	0.98376	0.25537	98.24805	±	0.14614 ± 0.09438	0.41285 ± 0.05652	0.02669 ± 0.03073	0 ± 0.00032	0 ± 0.00061	0.0116 ± 0.00839
LONGMO	01/06/97	06	24	F	0.9278 ± 0.1299	0.98952	0.16828	113.6065	0.24133 ± 0.0652	0.08698 ± 0.05617	0.57638 ± 0.0789	0.00197 ± 0.00227	0 ± 0.00007	0 ± 0.00032	0.01834 ± 0.01327
LONGMO	01/07/97	06	24	F	0.8448 ± 0.1277	0.96592	0.46705	115.7217	±	0.15 ± 0.09687	0.64659 ± 0.08851	0.02449 ± 0.0282	0 ± 0.00005	0 ± 0.00024	0.02275 ± 0.01646
LONGMO	01/13/97	06	24	F	1.3467 ± 0.1601	0.98743	0.1954	96.19735	0.25028 ± 0.06761	0.16764 ± 0.10827	0.90576 ± 0.12399	0.00193 ± 0.00222	0 ± 0.00023	0 ± 0.00075	0.01958 ± 0.01416
LONGMO	01/14/97	06	24	F	1.7166 ± 0.1928	0.99211	0.14891	94.56229	0.50922 ± 0.13757	0.19551 ± 0.12627	0.98351 ± 0.13464	0.00496 ± 0.00571	0 ± 0.00056	0 ± 0.00141	0.02195 ± 0.01588
LONGMO	01/15/97	06	24	F	0.9147 ± 0.1297	0.98202	0.30986	107.7938	0.14176 ± 0.0383	0.06351 ± 0.04102	0.6957 ± 0.09524	0.00364 ± 0.0042	0 ± 0.00019	0 ± 0.00026	0.0089 ± 0.00643
LONGMO	01/16/97	06	24	F	1.5489 ± 0.1751	0.9899	0.17696	80.86354	0.39045 ± 0.10548	0.14214 ± 0.0918	0.98462 ± 0.13479	0.00673 ± 0.00775	0 ± 0.00032	0 ± 0.00073	0.02296 ± 0.01661
LONGMO	01/17/97	06	24	F	2.3905 ± 0.2466	0.99048	0.17535	93.60557	0.51018 ± 0.13783	0.16073 ± 0.1038	1.66427 ± 0.22783	0.00584 ± 0.00673	0 ± 0.0003	0 ± 0.00164	0.04452 ± 0.0322
LONGMO	01/18/97	06	24	F	1.5361 ± 0.1755	0.99117	0.14914	92.57707	0.35588 ± 0.09615	0.13102 ± 0.08462	1.0356 ± 0.14177	0.0055 ± 0.00634	0 ± 0.0001	0 ± 0.00095	0.00673 ± 0.00487
LONGMO	01/19/97	06	24	F	1.1475 ± 0.1466	0.98951	0.17283	120.5118	0.41021 ± 0.11082	0.09287 ± 0.05998	0.63977 ± 0.08758	0.00492 ± 0.00567	0 ± 0.00008	0 ± 0.00113	0.00069 ± 0.0005
LONGMO	01/20/97	06	24	F	2.3954 ± 0.2443	0.98845	0.18996	110.6792	0.26017 ± 0.07029	0.03703 ± 0.02392	2.07328 ± 0.28382	0.00626 ± 0.00721	0 ± 0.00006	0 ± 0.00053	0.01017 ± 0.00736
LONGMO	01/27/97	06	24	F	0.7581 ± 0.1193	0.97735	0.36595	88.72358	0.11323 ± 0.03059	0.09693 ± 0.0626	0.53304 ± 0.07297	0.0023 ± 0.00265	0 ± 0.00018	0 ± 0.00054	0.00832 ± 0.00602
LONGMO	01/28/97	06	24	F	2.5442 ± 0.2582	0.98397	0.26647	88.54654	0.31939 ± 0.08629	0.04955 ± 0.032	2.14987 ± 0.29431	0.00803 ± 0.00924	0 ± 0.00029	0 ± 0.0008	0.0069 ± 0.00499
LONGMO	01/29/97	06	24	F	1.0379 ± 0.1376	0.98115	0.31904	93.4498	0.25095 ± 0.0678	0.03634 ± 0.02347	0.73455 ± 0.10056	0.00247 ± 0.00284	0 ± 0.00018	0 ± 0.0005	0.00903 ± 0.00653
LONGMO	01/30/97	06	24	F	1.061 ± 0.1444	0.97226	0.4463	47.59289	0.14669 ± 0.03963	0.04749 ± 0.03067	0.83053 ± 0.1137	0.00513 ± 0.00591	0 ± 0.00008	0 ± 0.0005	0.02732 ± 0.01976
FTCOLL	12/18/96	06	24	F	0.7429 ± 0.1212	0.92663	1.02211	110.0238	0.12639 ± 0.03415	0.11667 ± 0.07535	0.40983 ± 0.0561	0.05624 ± 0.06475	0 ± 0.00008	0 ± 0.00011	0.03482 ± 0.02518
FTCOLL	12/19/96	06	24	F	2.229 ± 0.2331	0.97275	0.48621	99.85317	0.34155 ± 0.09227	0.15098 ± 0.09751	1.70345 ± 0.23319	0.02715 ± 0.03127	0 ± 0.00011	0 ± 0.00041	0.00301 ± 0.00218
FTCOLL	12/25/96	06	24	F	0.2902 ± 0.1015	0.9837	0.2405	120.0478	0.17106 ± 0.04621	0.04861 ± 0.03139	0.05596 ± 0.00766	0.00862 ± 0.00993	0 ± 0.00012	0 ± 0.00032	0.00531 ± 0.00384
FTCOLL	12/26/96	06	24	F	1.7221 ± 0.1923	0.98751	0.22401	106.0439	0.15285 ± 0.04129	0.32568 ± 0.21034	1.1767 ± 0.16108	0.05048 ± 0.05813	0 ± 0.00031	0 ± 0.00066	0.01618 ± 0.01171
FTCOLL	12/30/96	06	24	F	3.5481 ± 0.3481	0.97151	0.39489	122.251	0.57013 ± 0.15403	±	2.92766 ± 0.40078	0.03725 ± 0.0429	0 ± 0.00004	0 ± 0.00023	0.01168 ± 0.00845
FTCOLL	12/31/96	06	24	F	3.463 ± 0.3391	0.96784	0.43073	105.0524	0.43385 ± 0.11721	0.34345 ± 0.22181	2.62194 ± 0.35893	0.04678 ± 0.05387	0 ± 0.00003	0 ± 0.00021	0.02573 ± 0.01861
FTCOLL	01/01/97	06	24	F	1.8959 ± 0.2047	0.9737	0.38161	105.942	0.34194 ± 0.09238	0.24611 ± 0.15894	1.28685 ± 0.17616	0.01768 ± 0.02035	0 ± 0.00003	0 ± 0.00028	0.00382 ± 0.00277
FTCOLL	01/02/97	06	24	F	1.722 ± 0.1905	0.92817	0.82221	110.8447	0.10054 ± 0.02716	0.19689 ± 0.12716	1.37574 ± 0.18833	0.02872 ± 0.03307	0 ± 0.00001	0 ± 0.00012	0.02642 ± 0.01911
FTCOLL	01/06/97	06	24	F	0.9887 ± 0.1349	0.97973	0.28115	91.64814	0.13551 ± 0.03661	0.11034 ± 0.07126	0.71564 ± 0.09797	0.02447 ± 0.02817	0 ± 0.00005	0 ± 0.00016	±
FTCOLL	01/07/97	06	24	F	1.0344 ± 0.1391	0.95386	0.6025	93.44357	0.13579 ± 0.03669	0.13277 ± 0.08575	0.70781 ± 0.0969	0.04965 ± 0.05716	0 ± 0.00004	0 ± 0.00014	0.00971 ± 0.00703
FTCOLL	01/12/97	06	24	F	0.4408 ± 0.1068	0.96419	0.55485	84.19773	0.02464 ± 0.00666	0.14865 ± 0.096	0.24449 ± 0.03347	0.01327 ± 0.01528	0 ± 0.00011	0 ± 0.00015	0.00899 ± 0.0065
FTCOLL	01/13/97	06	24	F	0.939 ± 0.133	0.98439	0.25643	91.72906	0.17874 ± 0.04829	0.11215 ± 0.07243	0.63246 ± 0.08658	0.00742 ± 0.00855	0 ± 0.00013	0 ± 0.00042	0.00754 ± 0.00545
FTCOLL	01/14/97	06	24	F	1.6243 ± 0.1822	0.98588	0.24047	88.40793	0.40916 ± 0.11054	0.17379 ± 0.11224	1.02019 ± 0.13966	0.01697 ± 0.01954	0 ± 0.00024	0 ± 0.00123	0.00395 ± 0.00286
FTCOLL	01/15/97	06	24	F	0.8213 ± 0.1273	0.97464	0.42815	99.23792	0.22366 ± 0.06042	0.07 ± 0.04521	0.48263 ± 0.06607	0.0031 ± 0.00357	0 ± 0.00017	0 ± 0.00034	0.04044 ± 0.02925
FTCOLL	01/16/97	06	24	F	1.6572 ± 0.1857	0.98921	0.19074	84.63582	0.3261 ± 0.0881	0.14982 ± 0.09676	1.14475 ± 0.15671	0.00534 ± 0.00615	0 ± 0.00027	0 ± 0.00071	0.02804 ± 0.02028
FTCOLL	01/17/97	06	24	F	2.6344 ± 0.269	0.98815	0.20442	98.62191	0.51439 ± 0.13897	0.10696 ± 0.06908	1.98918 ± 0.27231	0.00732 ± 0.00843	0 ± 0.0002	0 ± 0.00079	0.01209 ± 0.00874
FTCOLL	01/18/97	06	24	F	2.3018 ± 0.2387	0.96719	0.56913	97.50018	0.49 ± 0.13238	0.22168 ± 0.14317	1.57829 ± 0.21606	0.01265 ± 0.01456	0 ± 0.00008	0 ± 0.00076	±
FTCOLL	01/19/97	06	24	F	1.8102 ± 0.1974	0.97817	0.32126	93.78861	0.53131 ± 0.14354	0.14599 ± 0.09429	1.12953 ± 0.15463	0.0049 ± 0.00564	0 ± 0.00003	0 ± 0.00034	±

Table C.1B-4 (continued)
24-Hour Contributions to Elemental Carbon at Core and Satellite Sites for Individual Samples - NFRAQS Winter 1996/97, Conventional CMB

Site ID	Sample Date	Start Hour	Duration (hrs)	Size	Elemental Carbon (µg/m^3)	R-square	Chi-square	Percent of Mass	Light-Duty Gasoline Vehicle Exhaust	Diesel Exhaust Diesel Exhaust	Paved Road Dust	Meat Cooking and Wood Combustion	Ammonium Sulfate	Ammonium Nitrate	Coal-Fired Power Plant
FTCOLL	01/20/97	06	24	F	2.8146 ± 0.2833	0.98182	0.30262	106.2038	0.60384 ± 0.16313	0.06132 ± 0.0396	2.13544 ± 0.29233	0.01191 ± 0.01371	0 ± 0.00005	0 ± 0.00058	±
FTCOLL	01/27/97	06	24	F	1.19 ± 0.1495	0.98598	0.24124	93.5173	0.18747 ± 0.05065	0.08108 ± 0.05236	0.90388 ± 0.12374	0.00058 ± 0.00067	0 ± 0.00028	0 ± 0.00071	0.01128 ± 0.00816
FTCOLL	01/29/97	06	24	F	1.8486 ± 0.1993	0.98593	0.24241	94.7873	0.29525 ± 0.07977	0.05792 ± 0.03741	1.46479 ± 0.20052	0.0013 ± 0.00149	0 ± 0.00019	0 ± 0.00103	0.01989 ± 0.01438
FTCOLL	01/30/97	06	24	F	1.8819 ± 0.2043	0.97393	0.44589	102.6004	0.45059 ± 0.12173	±	1.39156 ± 0.1905	0.02524 ± 0.02906	0 ± 0.00008	0 ± 0.00075	0.01428 ± 0.01033
EVANS	12/18/96	06	24	F	0.68135 ± 0.1826	0.96393	0.53158	97.59219	0.10344 ± 0.02794	0.12331 ± 0.07963	0.4134 ± 0.05659	0.00328 ± 0.00378	0 ± 0.00009	0 ± 0.00009	0.0364 ± 0.02633
EVANS	12/19/96	06	24	F	2.08772 ± 0.2544	0.98589	0.23648	88.45834	0.14556 ± 0.03932	0.29005 ± 0.18732	1.61676 ± 0.22133	0.02364 ± 0.02722	0 ± 0.0002	0 ± 0.00061	0.00743 ± 0.00537
EVANS	01/07/97	06	24	F	0.82385 ± 0.18303	0.98428	0.21522	95.91374	0.05713 ± 0.01543	0.23596 ± 0.15239	0.49305 ± 0.0675	0.0265 ± 0.03051	0 ± 0.00007	0 ± 0.00024	0.00989 ± 0.00716
EVANS	01/13/97	06	24	F	0.98875 ± 0.18464	0.97646	0.42592	97.27538	0.2731 ± 0.07378	0.1543 ± 0.09965	0.51697 ± 0.07077	0.00719 ± 0.00828	0 ± 0.00028	0 ± 0.00066	0.03307 ± 0.02392
EVANS	01/14/97	06	24	F	1.51375 ± 0.21781	0.98366	0.31031	94.20854	0.49582 ± 0.13395	0.09443 ± 0.06098	0.90479 ± 0.12386	0.01123 ± 0.01293	0 ± 0.00073	0 ± 0.00153	0.00975 ± 0.00705
EVANS	01/15/97	06	24	F	0.71087 ± 0.20196	0.95543	0.73735	101.1532	0.25215 ± 0.06812	0.07498 ± 0.04843	0.34418 ± 0.04712	0.00244 ± 0.00281	0 ± 0.00031	0 ± 0.00036	0.0387 ± 0.02799
EVANS	01/16/97	06	24	F	1.38702 ± 0.20885	0.97972	0.37555	85.73607	0.35311 ± 0.09539	0.10324 ± 0.06668	0.88731 ± 0.12147	0.00673 ± 0.00775	0 ± 0.00035	0 ± 0.00056	0.03416 ± 0.02471
EVANS	01/17/97	06	24	F	3.0762 ± 0.33042	0.98456	0.30133	90.5602	0.76043 ± 0.20544	0.15187 ± 0.09808	2.11526 ± 0.28957	0.01618 ± 0.01863	0 ± 0.00058	0 ± 0.00191	0.03564 ± 0.02578
EVANS	01/18/97	06	24	F	2.78385 ± 0.3027	0.98571	0.25087	98.33311	0.67796 ± 0.18316	0.19346 ± 0.12494	1.90903 ± 0.26134	0.00929 ± 0.01069	0 ± 0.00035	0 ± 0.00211	±
EVANS	01/19/97	06	24	F	1.98573 ± 0.24446	0.98906	0.19612	95.45865	0.59924 ± 0.16189	0.10808 ± 0.0698	1.26772 ± 0.17354	0.00441 ± 0.00508	0 ± 0.0002	0 ± 0.00158	0.00835 ± 0.00604
EVANS	01/20/97	06	24	F	3.9049 ± 0.40208	0.97123	0.53447	94.7924	0.81119 ± 0.21915	0.11728 ± 0.07574	2.95154 ± 0.40405	0.01234 ± 0.01421	0 ± 0.0002	0 ± 0.00168	0.01005 ± 0.00727
EVANS	01/27/97	06	24	F	0.9073 ± 0.19786	0.96505	0.57332	90.37071	0.21327 ± 0.05762	0.09503 ± 0.06137	0.56942 ± 0.07795	0.00085 ± 0.00098	0 ± 0.00029	0 ± 0.00051	0.02548 ± 0.01843
EVANS	01/28/97	06	24	F	2.72108 ± 0.30199	0.985	0.27906	89.99394	0.57372 ± 0.155	0.11026 ± 0.07121	2.01064 ± 0.27525	0.00256 ± 0.00294	0 ± 0.00044	0 ± 0.00131	0.01585 ± 0.01146
EVANS	01/29/97	06	24	F	1.37443 ± 0.21173	0.97875	0.32941	103.5719	0.42292 ± 0.11425	0.03411 ± 0.02203	0.91169 ± 0.12481	0.00337 ± 0.00389	0 ± 0.00016	0 ± 0.00053	0.00162 ± 0.00117
EVANS	01/30/97	06	24	F	1.9833 ± 0.24806	0.93072	1.27257	91.4053	0.46813 ± 0.12647	0.08477 ± 0.05474	1.37243 ± 0.18788	0.00091 ± 0.00105	0 ± 0.00025	0 ± 0.0015	0.06579 ± 0.04759
MASTER	12/19/96	06	24	F	0.791 ± 0.124	0.98382	0.21832	76.39304	±	0.1616 ± 0.10437	0.58414 ± 0.07997	0.03773 ± 0.04345	0 ± 0.00014	0 ± 0.00049	0.00519 ± 0.00375
MASTER	12/25/96	06	24	F	0.0632 ± 0.112	0.95852	0.46025	90.84805	±	0.07608 ± 0.04913	±	0.05115 ± 0.05889	0 ± 0.00016	0 ± 0.00034	0.00223 ± 0.00161
MASTER	12/31/96	06	24	F	0.6557 ± 0.1143	0.94873	0.67545	62.35867	±	0.1233 ± 0.07963	0.44916 ± 0.06149	0.05976 ± 0.06881	0 ± 0.00006	0 ± 0.00025	0.00961 ± 0.00695
MASTER	01/02/97	06	24	F	1.0522 ± 0.1343	0.95168	0.51645	99.87712	±	0.21462 ± 0.13861	0.58465 ± 0.08004	0.17438 ± 0.20079	0 ± 0.00003	0 ± 0.00037	0.06005 ± 0.04343
MASTER	01/06/97	06	24	F	0.313 ± 0.0925	0.98291	0.22664	97.4642	±	0.09562 ± 0.06176	0.18456 ± 0.02527	0.02953 ± 0.034	0 ± 0.00008	0 ± 0.00024	±
MASTER	01/07/97	06	24	F	0.4099 ± 0.0964	0.94355	0.50102	80.51696	±	0.11769 ± 0.07601	0.09237 ± 0.01265	0.16848 ± 0.19399	0 ± 0.00005	0 ± 0.00021	0.01846 ± 0.01335
MASTER	01/13/97	06	24	F	1.1143 ± 0.1439	0.98279	0.28705	81.78017	0.0898 ± 0.02426	0.29939 ± 0.19335	0.672 ± 0.09199	0.04074 ± 0.04691	0 ± 0.00051	0 ± 0.00125	0.01023 ± 0.0074
MASTER	01/14/97	06	24	F	0.5065 ± 0.1078	0.98179	0.24104	91.60244	0.00782 ± 0.00211	0.21711 ± 0.14021	0.24971 ± 0.03418	0.02823 ± 0.0325	0 ± 0.00023	0 ± 0.00073	0.00249 ± 0.0018
MASTER	01/15/97	06	24	F	0.0812 ± 0.1156	0.97238	0.24964	96.72958	±	0.13549 ± 0.0875	±	0.02515 ± 0.02896	0 ± 0.00014	0 ± 0.00003	±
MASTER	01/16/97	06	24	F	0.5132 ± 0.1103	0.9744	0.34776	87.00994	±	0.17153 ± 0.11078	0.26656 ± 0.03649	0.06088 ± 0.07009	0 ± 0.00024	0 ± 0.00042	0.00719 ± 0.0052
MASTER	01/17/97	06	24	F	2.1697 ± 0.2274	0.98841	0.2109	88.57611	0.26691 ± 0.07211	0.44029 ± 0.28435	1.38136 ± 0.1891	0.06181 ± 0.07116	0 ± 0.00077	0 ± 0.00206	0.01648 ± 0.01192
MASTER	01/18/97	06	24	F	1.1853 ± 0.1494	0.98978	0.1557	89.2774	0.30806 ± 0.08322	0.16383 ± 0.10581	0.66762 ± 0.09139	0.01505 ± 0.01733	0 ± 0.00026	0 ± 0.00166	0.02818 ± 0.02038
MASTER	01/19/97	06	24	F	1.3486 ± 0.1609	0.98825	0.17042	88.34245	0.34045 ± 0.09198	0.34107 ± 0.22027	0.60264 ± 0.0825	0.03232 ± 0.03722	0 ± 0.00025	0 ± 0.00224	0.03073 ± 0.02223
MASTER	01/20/97	06	24	F	2.2181 ± 0.2334	0.98789	0.19858	87.44274	0.54913 ± 0.14835	0.11906 ± 0.07689	1.51334 ± 0.20717	0.01179 ± 0.01357	0 ± 0.00025	0 ± 0.00174	0.02124 ± 0.01536
MASTER	01/27/97	06	24	F	0.3924 ± 0.1029	0.9597	0.48062	82.1172	0.10884 ± 0.0294	0.10131 ± 0.06543	0.14329 ± 0.01962	0.00903 ± 0.01039	0 ± 0.00016	0 ± 0.00037	0.02775 ± 0.02007
MASTER	01/28/97	06	24	F	1.1207 ± 0.1447	0.99159	0.1525	95.04123	0.29982 ± 0.081	0.10351 ± 0.06685	0.68965 ± 0.09441	0.00435 ± 0.00501	0 ± 0.00033	0 ± 0.0011	0.02117 ± 0.01531
MASTER	01/29/97	06	24	F	0.4399 ± 0.105	0.96255	0.61875	124.941	0.19579 ± 0.05289	0.03894 ± 0.02515	0.16697 ± 0.02286	0.00025 ± 0.00029	0 ± 0.00012	0 ± 0.00033	0.03801 ± 0.02749
MASTER	01/30/97	06	24	F	1.2067 ± 0.1505	0.98843	0.20641	106.4253	0.3149 ± 0.08507	0.0688 ± 0.04443	0.7972 ± 0.10913	0.0022 ± 0.00253	0 ± 0.00023	0 ± 0.00143	0.01912 ± 0.01383

Table C.1B-5
24-Hour Contributions to Total Carbon at Core and Satellite Sites for Individual Samples - NFRAQS Winter 1996/97, Conventional CMB

Site ID	Sample Date	Start Hour	Duration (hrs)	Size	Total Carbon (μg/m^3)	R-square	Chi-square	Percent of Mass	Light-Duty Gasoline Vehicle Exhaust	Diesel Exhaust Diesel Exhaust	Paved Road Dust	Meat Cooking and Wood Combustion	Ammonium Sulfate	Ammonium Nitrate	Coal-Fired Power Plant
CHATFR	12/26/96	06	24	F	3.8001 ± 1.5302	0.98515	0.18214	90.91528	±	±	±	0.29303 ± 0.09322	0 ± 0.00039	0 ± 0.00061	0.02941 ± 0.02929
CHATFR	12/30/96	06	24	F	0 ± 1.4151	0.78179	0.29571	78.05833	±	±	±	0.16458 ± 0.05236	0 ± 0.00004	0 ± 0.00004	0.00747 ± 0.00744
CHATFR	01/01/97	06	24	F	0.3429 ± 1.4011	0.65001	0.28459	84.70837	±	±	±	0.06179 ± 0.01966	0 ± 0.00001	0 ± 0.00005	0.00234 ± 0.00233
CHATFR	01/02/97	06	24	F	1.8364 ± 1.5158	0.87897	0.22442	89.063	±	±	±	0.10215 ± 0.0325	0 ± 0.00003	0 ± 0.00012	0.00604 ± 0.00601
CHATFR	01/06/97	06	24	F	1.6833 ± 1.4852	0.94732	0.15571	82.79858	±	±	±	0.03461 ± 0.01101	0 ± 0.00008	0 ± 0.00017	0.00768 ± 0.00764
CHATFR	01/07/97	06	24	F	3.0915 ± 1.5275	0.95753	0.1906	111.3134	±	±	1.07668 ± 0.04268	0.14263 ± 0.04537	0 ± 0.00008	0 ± 0.00019	0.00492 ± 0.0049
CHATFR	01/12/97	06	24	F	4.1998 ± 1.657	0.98467	0.16939	99.00449	±	±	0.91309 ± 0.03619	0.05738 ± 0.01825	0 ± 0.00046	0 ± 0.00047	±
CHATFR	01/16/97	06	24	F	1.8335 ± 1.4572	0.98669	0.1297	87.47671	±	±	0.14756 ± 0.00585	0.10961 ± 0.03487	0 ± 0.00031	0 ± 0.00036	0.00547 ± 0.00545
CHATFR	01/19/97	06	24	F	0 ± 1.3868	0.73297	0.19843	44.64126	±	±	±	0.04237 ± 0.01348	0 ± 0.00003	0 ± 0.00006	±
CHATFR	01/20/97	06	24	F	0.2717 ± 1.4514	0.7494	0.2183	95.5383	±	±	±	0.15178 ± 0.04828	0 ± 0.00002	0 ± 0.00004	±
CHATFR	01/27/97	06	24	F	1.1612 ± 1.4465	0.96785	0.2124	65.67958	±	±	±	0.07619 ± 0.02424	0 ± 0.00022	0 ± 0.00025	±
CHATFR	01/28/97	06	24	F	4.3513 ± 1.6054	0.96873	0.1722	77.16116	±	±	1.31933 ± 0.05229	0.97279 ± 0.30946	0 ± 0.00006	0 ± 0.00022	0.02158 ± 0.02149
HIGHRA	12/18/96	06	24	F	3.5073 ± 0.4182	0.99073	0.13273	120.1067	±	±	1.49354 ± 0.0592	0.06561 ± 0.02087	0 ± 0.00011	0 ± 0.00016	±
HIGHRA	12/19/96	06	24	F	1.9801 ± 0.3571	0.99078	0.12627	94.94035	±	±	0.13573 ± 0.00538	0.04011 ± 0.01276	0 ± 0.00008	0 ± 0.00018	0.00544 ± 0.00542
HIGHRA	12/25/96	06	24	F	2.172 ± 0.3646	0.98803	0.1832	107.5622	±	±	0.23579 ± 0.00935	0.02354 ± 0.00749	0 ± 0.00012	0 ± 0.00029	0.00721 ± 0.00718
HIGHRA	12/26/96	06	24	F	3.5349 ± 0.4163	0.97592	0.42963	107.3495	±	±	0.6746 ± 0.02674	0.10072 ± 0.03204	0 ± 0.00021	0 ± 0.00059	0.01955 ± 0.01947
HIGHRA	12/30/96	06	24	F	3.5093 ± 0.4155	0.98244	0.13252	122.4861	±	±	0.63813 ± 0.02529	0.2043 ± 0.06499	0 ± 0.00004	0 ± 0.00002	0.00322 ± 0.0032
HIGHRA	12/31/96	06	24	F	2.0795 ± 0.3652	0.97273	0.15023	147.2845	±	±	0.30002 ± 0.01189	0.11388 ± 0.03623	0 ± 0.00003	0 ± 0.00001	0.01173 ± 0.01168
HIGHRA	01/01/97	06	24	F	1.3786 ± 0.413	0.94003	0.14217	66.72315	±	±	±	0.1108 ± 0.03525	0 ± 0.00001	0 ± 0.00001	0.00259 ± 0.00258
HIGHRA	01/02/97	06	24	F	2.5022 ± 0.3844	0.96687	0.22852	124.9492	±	±	0.30653 ± 0.01215	0.23444 ± 0.07458	0 ± 0.00002	0 ± 0.00005	0.01133 ± 0.01128
HIGHRA	01/06/97	06	24	F	2.3629 ± 0.3694	0.98347	0.23988	131.1936	±	±	0.40214 ± 0.01594	0.02253 ± 0.00717	0 ± 0.0001	0 ± 0.00044	±
HIGHRA	01/07/97	06	24	F	4.2018 ± 0.4467	0.99331	0.11587	109.334	±	±	1.03898 ± 0.04118	0.12742 ± 0.04053	0 ± 0.00013	0 ± 0.0004	0.00269 ± 0.00268
HIGHRA	01/12/97	06	24	F	6.6684 ± 0.5673	0.95112	0.89581	93.80368	±	±	1.41353 ± 0.05603	0.2418 ± 0.07692	0 ± 0.00035	0 ± 0.00044	±
HIGHRA	01/13/97	06	24	F	10.0563 ± 0.7699	0.97117	0.54014	94.85719	±	±	1.44004 ± 0.05708	0.14435 ± 0.04592	0 ± 0.00102	0 ± 0.00191	±
HIGHRA	01/14/97	06	24	F	6.9432 ± 0.586	0.97707	0.43101	86.73393	±	±	0.89502 ± 0.03548	0.12613 ± 0.04013	0 ± 0.00056	0 ± 0.00126	±
HIGHRA	01/15/97	06	24	F	2.6765 ± 0.3764	0.96732	0.42709	96.32978	±	±	±	0.12375 ± 0.03937	0 ± 0.00019	0 ± 0.00014	±
HIGHRA	01/16/97	06	24	F	3.5244 ± 0.4135	0.99249	0.12934	88.46647	±	±	0.50885 ± 0.02017	0.08152 ± 0.02593	0 ± 0.00027	0 ± 0.00038	0.00188 ± 0.00187
HIGHRA	01/17/97	06	24	F	5.5019 ± 0.5091	0.96427	0.63181	92.83222	±	±	0.69865 ± 0.02769	0.36774 ± 0.11698	0 ± 0.00022	0 ± 0.001	±
HIGHRA	01/18/97	06	24	F	2.6592 ± 0.3819	0.92665	0.45687	96.65108	±	±	0.04605 ± 0.00183	0.1783 ± 0.05672	0 ± 0.00002	0 ± 0.00004	0.00036 ± 0.00036
HIGHRA	01/19/97	06	24	F	2.9782 ± 0.393	0.90211	0.45611	167.4349	±	±	±	0.17629 ± 0.05608	0 ± 0.00002	0 ± 0.00003	0.0022 ± 0.00219
HIGHRA	01/20/97	06	24	F	3.2766 ± 0.4047	0.96319	0.17612	118.9875	±	±	±	0.31739 ± 0.10097	0 ± 0.00002	0 ± 0.00001	±
HIGHRA	01/28/97	06	24	F	2.9754 ± 0.3893	0.9842	0.18116	114.5939	±	±	0.47345 ± 0.01877	0.19974 ± 0.06354	0 ± 0.00006	0 ± 0.00009	0.01228 ± 0.01223
HIGHRA	01/29/97	06	24	F	1.7756 ± 0.3507	0.98583	0.19774	114.2406	±	±	0.09808 ± 0.00389	0.01678 ± 0.00534	0 ± 0.00014	0 ± 0.00014	0.00661 ± 0.00658
HIGHRA	01/30/97	06	24	F	2.2872 ± 0.3682	0.97668	0.10363	151.9752	±	±	±	0.14562 ± 0.04632	0 ± 0.00002	0 ± 0.00001	0.00459 ± 0.00457
CAMP	12/19/96	06	24	F	8.8053 ± 0.7049	0.94937	0.95815	90.01234	±	±	1.64124 ± 0.06505	0.15614 ± 0.04967	0 ± 0.00047	0 ± 0.00078	±
CAMP	12/25/96	06	24	F	4.9291 ± 0.4915	0.9898	0.1615	103.0331	±	±	0.22305 ± 0.00884	0.06161 ± 0.0196	0 ± 0.00022	0 ± 0.00049	0.00502 ± 0.00499
CAMP	12/26/96	06	24	F	13.5711 ± 0.9916	0.99067	0.18693	95.75629	±	±	4.59789 ± 0.18224	0.35443 ± 0.11275	0 ± 0.00057	0 ± 0.00148	0.00813 ± 0.00809
CAMP	12/30/96	06	24	F	8.5336 ± 0.6828	0.97513	0.34234	102.7761	±	±	3.3702 ± 0.13358	0.4473 ± 0.14229	0 ± 0.00011	0 ± 0.00016	0.00509 ± 0.00507
CAMP	01/01/97	06	24	F	9.4137 ± 0.7376	0.98366	0.28515	89.92791	±	±	2.26377 ± 0.08973	0.32839 ± 0.10447	0 ± 0.00015	0 ± 0.00049	0.02542 ± 0.02531
CAMP	01/02/97	06	24	F	13.6391 ± 0.9974	0.94845	0.72997	103.0572	±	±	5.05275 ± 0.20027	0.58586 ± 0.18637	0 ± 0.0001	0 ± 0.00038	0.039 ± 0.03883
CAMP	01/06/97	06	24	F	4.8222 ± 0.4666	0.98228	0.28614	96.0089	±	±	0.83444 ± 0.03307	0.06645 ± 0.02114	0 ± 0.00022	0 ± 0.00049	±
CAMP	01/07/97	06	24	F	8.5455 ± 0.7105	0.97126	0.47818	73.12263	±	±	2.1082 ± 0.08356	0.4218 ± 0.13418	0 ± 0.00022	0 ± 0.00074	0.01178 ± 0.01173
CAMP	01/12/97	06	24	F	6.9183 ± 0.5877	0.98741	0.20169	83.91831	±	±	1.10939 ± 0.04397	0.03933 ± 0.01251	0 ± 0.00041	0 ± 0.00048	±
CAMP	01/13/97	06	24	F	12.7694 ± 0.9548	0.9641	0.65657	99.0966	±	±	2.77867 ± 0.11014	0.10918 ± 0.03473	0 ± 0.00115	0 ± 0.00184	±
CAMP	01/14/97	06	24	F	12.9401 ± 0.9482	0.93845	1.26543	101.6282	±	±	2.68023 ± 0.10623	0.18638 ± 0.05929	0 ± 0.00095	0 ± 0.00165	±
CAMP	01/15/97	06	24	F	4.5947 ± 0.4832	0.9924	0.12251	100.8858	±	±	0.43577 ± 0.01727	0.06638 ± 0.02112	0 ± 0.00024	0 ± 0.00024	0.00579 ± 0.00577
CAMP	01/16/97	06	24	F	8.3618 ± 0.6702	0.98556	0.29293	117.5822	±	±	1.92034 ± 0.07611	0.0789 ± 0.0251	0 ± 0.00058	0 ± 0.00079	0.01752 ± 0.01745
CAMP	01/17/97	06	24	F	17.2121 ± 1.2241	0.98896	0.21282	111.3536	±	±	3.96238 ± 0.15705	0.25648 ± 0.08159	0 ± 0.00053	0 ± 0.00169	0.00287 ± 0.00286
CAMP	01/27/97	06	24	F	5.6599 ± 0.5221	0.98119	0.32853	96.30502	±	±	1.54312 ± 0.06116	0.0186 ± 0.00592	0 ± 0.00038	0 ± 0.00062	0.01762 ± 0.01755
CAMP	01/28/97	06	24	F	10.6865 ± 0.8141	0.96986	0.48498	96.44233	±	±	4.13909 ± 0.16406	0.74291 ± 0.23633	0 ± 0.00019	0 ± 0.00052	0.00417 ± 0.00416
CAMP	01/30/97	06	24	F	7.189 ± 0.6083	0.9776	0.18487	98.10446	±	±	1.14859 ± 0.04553	0.70189 ± 0.22328	0 ± 0.00005	0 ± 0.00004	0.01334 ± 0.01328

Table C.1B-5 (continued)
24-Hour Contributions to Total Carbon at Core and Satellite Sites for Individual Samples - NFRAQS Winter 1996/97, Conventional CMB

Site ID	Sample Date	Start Hour	Duration (hrs)	Size	Total Carbon (μg/m^3)	R-square	Chi-square	Percent of Mass	Light-Duty Gasoline Vehicle Exhaust	Diesel Exhaust Diesel Exhaust	Paved Road Dust	Meat Cooking and Wood Combustion	Ammonium Sulfate	Ammonium Nitrate	Coal-Fired Power Plant
WELBY	12/19/96	06	24	F	7.64068 ± 0.40916	0.95026	0.80089	101.2129	±	±	1.52573 ± 0.06047	0.17142 ± 0.05453	0 ± 0.0003	0 ± 0.00071	±
WELBY	12/25/96	06	24	F	1.78478 ± 0.23636	0.99223	0.0958	96.29114	±	±	0.1177 ± 0.00467	0.05057 ± 0.01609	0 ± 0.00019	0 ± 0.00041	0.00638 ± 0.00636
WELBY	12/30/96	06	24	F	7.2576 ± 0.38865	0.95566	0.54669	118.7855	±	±	2.33927 ± 0.09272	0.39638 ± 0.1261	0 ± 0.00008	0 ± 0.00017	±
WELBY	01/02/97	06	24	F	8.81197 ± 0.46843	0.96166	0.54154	113.8358	±	±	3.2556 ± 0.12904	0.48852 ± 0.15541	0 ± 0.00014	0 ± 0.00023	0.01998 ± 0.01989
WELBY	01/06/97	06	24	F	4.2547 ± 0.29206	0.96669	0.52827	93.4576	±	±	0.7614 ± 0.03018	0.1958 ± 0.06229	0 ± 0.00016	0 ± 0.00047	±
WELBY	01/07/97	06	24	F	5.89113 ± 0.36269	0.97468	0.38597	91.90707	±	±	1.10572 ± 0.04383	0.64727 ± 0.20591	0 ± 0.00014	0 ± 0.00056	±
WELBY	01/12/97	06	24	F	2.72635 ± 0.28308	0.98413	0.22353	94.60921	±	±	0.521 ± 0.02065	0.01936 ± 0.00616	0 ± 0.00015	0 ± 0.00036	0.00525 ± 0.00523
WELBY	01/13/97	06	24	F	5.21368 ± 0.32362	0.9946	0.07903	88.94653	±	±	0.68673 ± 0.02722	0.03226 ± 0.01026	0 ± 0.00042	0 ± 0.00123	±
WELBY	01/15/97	06	24	F	2.87372 ± 0.25047	0.9942	0.09173	109.763	±	±	0.4043 ± 0.01602	0.039 ± 0.01241	0 ± 0.00022	0 ± 0.00019	0.00506 ± 0.00504
WELBY	01/16/97	06	24	F	6.8706 ± 0.39391	0.98477	0.2549	94.42807	±	±	1.48262 ± 0.05877	0.34375 ± 0.10935	0 ± 0.00037	0 ± 0.00068	±
WELBY	01/17/97	06	24	F	11.4947 ± 0.60466	0.96746	0.55554	93.46381	±	±	2.7226 ± 0.10791	0.31031 ± 0.09872	0 ± 0.00048	0 ± 0.00145	±
WELBY	01/18/97	06	24	F	8.18207 ± 0.42402	0.96237	0.6279	98.73391	±	±	1.6223 ± 0.0643	0.20255 ± 0.06444	0 ± 0.00008	0 ± 0.00061	0.00337 ± 0.00336
WELBY	01/19/97	06	24	F	7.8967 ± 0.42532	0.9594	0.50277	114.2671	±	±	0.67672 ± 0.02682	0.18879 ± 0.06006	0 ± 0.00006	0 ± 0.00023	±
WELBY	01/20/97	06	24	F	6.79948 ± 0.37956	0.96746	0.47735	123.5797	±	±	1.86043 ± 0.07374	0.21751 ± 0.06919	0 ± 0.0001	0 ± 0.00034	0.00671 ± 0.00668
WELBY	01/28/97	06	24	F	6.17408 ± 0.34883	0.95933	0.61502	93.12285	±	±	1.57343 ± 0.06236	0.90612 ± 0.28825	0 ± 0.00016	0 ± 0.00051	0.00167 ± 0.00166
WELBY	01/30/97	06	24	F	4.7448 ± 0.33859	0.9358	0.49748	129.3888	±	±	0.66815 ± 0.02648	0.23649 ± 0.07523	0 ± 0.00005	0 ± 0.00008	0.01205 ± 0.012

Table C.1B-6
24-Hour Contributions to Organic Carbon at Core and Satellite Sites for Individual Samples - NFRAQS Winter 1996/97, Conventional CMB

Site ID	Sample Date	Start Hour	Duration (hrs)	Size	Organic Carbon (µg/m^3)	R-square	Chi-square	Percent of Mass	Light-Duty Gasoline Vehicle Exhaust	Diesel Exhaust Diesel Exhaust	Paved Road Dust	Meat Cooking and Wood Combustion	Ammonium Sulfate	Ammonium Nitrate	Coal-Fired Power Plant
CHATFR	12/26/96	06	24	F	2.9174 ± 1.1438	0.98515	0.18214	90.91528	±	±	±	0.27104 ± 0.10856	0 ± 0.00028	0 ± 0.00043	0 ± 0.02013
CHATFR	12/30/96	06	24	F	0 ± 1.215	0.78179	0.29571	78.05833	±	±	±	0.15223 ± 0.06097	0 ± 0.00003	0 ± 0.00003	0 ± 0.00511
CHATFR	01/01/97	06	24	F	0.5417 ± 1.2312	0.65001	0.28459	84.70837	±	±	±	0.05715 ± 0.02289	0 ± 0.00001	0 ± 0.00004	0 ± 0.0016
CHATFR	01/02/97	06	24	F	1.4458 ± 1.337	0.87897	0.22442	89.063	±	±	±	0.09449 ± 0.03784	0 ± 0.00002	0 ± 0.00008	0 ± 0.00413
CHATFR	01/06/97	06	24	F	1.3546 ± 1.3172	0.94732	0.15571	82.79858	±	±	±	0.03201 ± 0.01282	0 ± 0.00006	0 ± 0.00012	0 ± 0.00525
CHATFR	01/07/97	06	24	F	1.6905 ± 1.3129	0.95753	0.1906	111.3134	±	±	0.21698 ± 0.0904	0.13192 ± 0.05284	0 ± 0.00006	0 ± 0.00013	0 ± 0.00337
CHATFR	01/12/97	06	24	F	2.8704 ± 1.2364	0.98467	0.16939	99.00449	±	±	0.18401 ± 0.07666	0.05308 ± 0.02126	0 ± 0.00033	0 ± 0.00033	±
CHATFR	01/16/97	06	24	F	1.2256 ± 1.2758	0.98669	0.1297	87.47671	±	±	0.02974 ± 0.01239	0.10139 ± 0.04061	0 ± 0.00022	0 ± 0.00025	0 ± 0.00375
CHATFR	01/19/97	06	24	F	0.241 ± 1.2145	0.73297	0.19843	44.64126	±	±	±	0.03919 ± 0.0157	0 ± 0.00002	0 ± 0.00004	±
CHATFR	01/20/97	06	24	F	0.4075 ± 1.2732	0.7494	0.2183	95.5383	±	±	±	0.14039 ± 0.05623	0 ± 0.00001	0 ± 0.00003	±
CHATFR	01/27/97	06	24	F	1.0859 ± 1.2793	0.96785	0.2124	65.67958	±	±	±	0.07047 ± 0.02822	0 ± 0.00015	0 ± 0.00018	±
CHATFR	01/28/97	06	24	F	2.7856 ± 1.1766	0.96873	0.1722	77.16116	±	±	0.26588 ± 0.11077	0.8998 ± 0.36038	0 ± 0.00005	0 ± 0.00016	0 ± 0.01477
HIGHRA	12/18/96	06	24	F	1.8295 ± 0.3282	0.99073	0.13273	120.1067	±	±	0.30099 ± 0.1254	0.06068 ± 0.0243	0 ± 0.00008	0 ± 0.00011	±
HIGHRA	12/19/96	06	24	F	1.3886 ± 0.3052	0.99078	0.12627	94.94035	±	±	0.02735 ± 0.0114	0.0371 ± 0.01486	0 ± 0.00006	0 ± 0.00013	0 ± 0.00373
HIGHRA	12/25/96	06	24	F	1.6572 ± 0.3177	0.98803	0.1832	107.5622	±	±	0.04752 ± 0.0198	0.02177 ± 0.00872	0 ± 0.00008	0 ± 0.00021	0 ± 0.00493
HIGHRA	12/26/96	06	24	F	2.3066 ± 0.3487	0.97592	0.42963	107.3495	±	±	0.13595 ± 0.05664	0.09316 ± 0.03731	0 ± 0.00015	0 ± 0.00042	0 ± 0.01338
HIGHRA	12/30/96	06	24	F	2.2023 ± 0.3424	0.98244	0.13252	122.4861	±	±	0.1286 ± 0.05358	0.18897 ± 0.07568	0 ± 0.00003	0 ± 0.00002	0 ± 0.0022
HIGHRA	12/31/96	06	24	F	1.4526 ± 0.3103	0.97273	0.15023	147.2845	±	±	0.06046 ± 0.02519	0.10534 ± 0.04219	0 ± 0.00002	0 ± 0.00001	0 ± 0.00803
HIGHRA	01/01/97	06	24	F	1.2064 ± 0.3033	0.94003	0.14217	66.72315	±	±	±	0.10249 ± 0.04105	0 ± 0.00001	0 ± 0.00001	0 ± 0.00178
HIGHRA	01/02/97	06	24	F	1.7188 ± 0.3283	0.96687	0.22852	124.9492	±	±	0.06177 ± 0.02574	0.21685 ± 0.08685	0 ± 0.00001	0 ± 0.00003	0 ± 0.00775
HIGHRA	01/06/97	06	24	F	1.519 ± 0.3119	0.98347	0.23988	131.1936	±	±	0.08104 ± 0.03376	0.02084 ± 0.00835	0 ± 0.00007	0 ± 0.00031	±
HIGHRA	01/07/97	06	24	F	2.6098 ± 0.3647	0.99331	0.11587	109.334	±	±	0.20938 ± 0.08723	0.11786 ± 0.0472	0 ± 0.00009	0 ± 0.00029	0 ± 0.00184
HIGHRA	01/12/97	06	24	F	4.6015 ± 0.4821	0.95112	0.89581	93.80368	±	±	0.28486 ± 0.11868	0.22366 ± 0.08958	0 ± 0.00025	0 ± 0.00032	±
HIGHRA	01/13/97	06	24	F	7.3297 ± 0.6734	0.97117	0.54014	94.85719	±	±	0.29021 ± 0.1209	0.13352 ± 0.05348	0 ± 0.00072	0 ± 0.00136	±
HIGHRA	01/14/97	06	24	F	4.8918 ± 0.5031	0.97707	0.43101	86.73393	±	±	0.18037 ± 0.07514	0.11667 ± 0.04673	0 ± 0.0004	0 ± 0.00089	±
HIGHRA	01/15/97	06	24	F	1.9372 ± 0.3249	0.96732	0.42709	96.32978	±	±	±	0.11447 ± 0.04584	0 ± 0.00013	0 ± 0.0001	±
HIGHRA	01/16/97	06	24	F	2.3844 ± 0.3498	0.99249	0.12934	88.46647	±	±	0.10255 ± 0.04272	0.0754 ± 0.0302	0 ± 0.00019	0 ± 0.00027	0 ± 0.00128
HIGHRA	01/17/97	06	24	F	3.8416 ± 0.4346	0.96427	0.63181	92.83222	±	±	0.1408 ± 0.05866	0.34015 ± 0.13623	0 ± 0.00016	0 ± 0.00071	±
HIGHRA	01/18/97	06	24	F	1.9458 ± 0.3319	0.92665	0.45687	96.65108	±	±	0.00928 ± 0.00387	0.16492 ± 0.06605	0 ± 0.00001	0 ± 0.00003	0 ± 0.00025
HIGHRA	01/19/97	06	24	F	2.6707 ± 0.3658	0.90211	0.45611	167.4349	±	±	±	0.16306 ± 0.06531	0 ± 0.00001	0 ± 0.00002	0 ± 0.00151
HIGHRA	01/20/97	06	24	F	2.4881 ± 0.3561	0.96319	0.17612	118.9875	±	±	±	0.29358 ± 0.11758	0 ± 0.00001	0 ± 0.00001	±
HIGHRA	01/28/97	06	24	F	1.929 ± 0.3265	0.9842	0.18116	114.5939	±	±	0.09541 ± 0.03975	0.18476 ± 0.074	0 ± 0.00004	0 ± 0.00006	0 ± 0.0084
HIGHRA	01/29/97	06	24	F	1.2959 ± 0.302	0.98583	0.19774	114.2406	±	±	0.01977 ± 0.00823	0.01553 ± 0.00622	0 ± 0.0001	0 ± 0.0001	0 ± 0.00452
HIGHRA	01/30/97	06	24	F	1.825 ± 0.3241	0.97668	0.10363	151.9752	±	±	±	0.13469 ± 0.05395	0 ± 0.00002	0 ± 0.00001	0 ± 0.00314
CAMP	12/19/96	06	24	F	5.4864 ± 0.5546	0.94937	0.95815	90.01234	±	±	0.33075 ± 0.1378	0.14443 ± 0.05784	0 ± 0.00034	0 ± 0.00056	±
CAMP	12/25/96	06	24	F	3.4825 ± 0.4229	0.9898	0.1615	103.0331	±	±	0.04495 ± 0.01873	0.05698 ± 0.02282	0 ± 0.00016	0 ± 0.00034	0 ± 0.00343
CAMP	12/26/96	06	24	F	7.411 ± 0.6868	0.99067	0.18693	95.75629	±	±	0.9266 ± 0.38603	0.32783 ± 0.1313	0 ± 0.0004	0 ± 0.00105	0 ± 0.00556
CAMP	12/30/96	06	24	F	4.3966 ± 0.4751	0.97513	0.34234	102.7761	±	±	0.67919 ± 0.28296	0.41374 ± 0.16571	0 ± 0.00008	0 ± 0.00011	0 ± 0.00349
CAMP	01/01/97	06	24	F	5.7818 ± 0.5712	0.98366	0.28515	89.92791	±	±	0.45621 ± 0.19006	0.30375 ± 0.12166	0 ± 0.00011	0 ± 0.00035	0 ± 0.01739
CAMP	01/02/97	06	24	F	7.1378 ± 0.6654	0.94845	0.72997	103.0572	±	±	1.01827 ± 0.42422	0.5419 ± 0.21703	0 ± 0.00007	0 ± 0.00027	0 ± 0.02669
CAMP	01/06/97	06	24	F	3.1592 ± 0.3875	0.98228	0.28614	96.0089	±	±	0.16816 ± 0.07006	0.06147 ± 0.02462	0 ± 0.00016	0 ± 0.00035	±
CAMP	01/07/97	06	24	F	5.0533 ± 0.5462	0.97126	0.47818	73.12263	±	±	0.42486 ± 0.177	0.39015 ± 0.15626	0 ± 0.00015	0 ± 0.00052	0 ± 0.00806
CAMP	01/12/97	06	24	F	5.0952 ± 0.5198	0.98741	0.20169	83.91831	±	±	0.22357 ± 0.09314	0.03638 ± 0.01457	0 ± 0.00029	0 ± 0.00034	±
CAMP	01/13/97	06	24	F	8.8997 ± 0.8053	0.9641	0.65657	99.0966	±	±	0.55998 ± 0.23329	0.10099 ± 0.04045	0 ± 0.00082	0 ± 0.00131	±
CAMP	01/14/97	06	24	F	8.3251 ± 0.7489	0.93845	1.26543	101.6282	±	±	0.54014 ± 0.22503	0.17239 ± 0.06905	0 ± 0.00068	0 ± 0.00117	±
CAMP	01/15/97	06	24	F	3.2961 ± 0.4174	0.9924	0.12251	100.8858	±	±	0.08782 ± 0.03659	0.0614 ± 0.02459	0 ± 0.00017	0 ± 0.00017	0 ± 0.00396
CAMP	01/16/97	06	24	F	5.2848 ± 0.5339	0.98556	0.29293	117.5822	±	±	0.387 ± 0.16123	0.07298 ± 0.02923	0 ± 0.00041	0 ± 0.00056	0 ± 0.01199
CAMP	01/17/97	06	24	F	10.8287 ± 0.9399	0.98896	0.21282	111.3536	±	±	0.79853 ± 0.33268	0.23723 ± 0.09501	0 ± 0.00037	0 ± 0.0012	0 ± 0.00196
CAMP	01/27/97	06	24	F	3.4073 ± 0.4127	0.98119	0.32853	96.30502	±	±	0.31098 ± 0.12956	0.01721 ± 0.00689	0 ± 0.00027	0 ± 0.00044	0 ± 0.01206
CAMP	01/28/97	06	24	F	5.5945 ± 0.5579	0.96986	0.48498	96.44233	±	±	0.83414 ± 0.34751	0.68716 ± 0.27522	0 ± 0.00014	0 ± 0.00037	0 ± 0.00286
CAMP	01/30/97	06	24	F	4.6559 ± 0.4948	0.9776	0.18487	98.10446	±	±	0.23147 ± 0.09643	0.64923 ± 0.26002	0 ± 0.00003	0 ± 0.00003	0 ± 0.00913

Table C.1B-6 (continued)
24-Hour Contributions to Organic Carbon at Core and Satellite Sites for Individual Samples - NFRAQS Winter 1996/97, Conventional CMB

Site ID	Sample Date	Start Hour	Duration (hrs)	Size	Organic Carbon (µg/m^3)	R-square	Chi-square	Percent of Mass	Light-Duty Gasoline Vehicle Exhaust	Diesel Exhaust Diesel Exhaust	Paved Road Dust	Meat Cooking and Wood Combustion	Ammonium Sulfate	Ammonium Nitrate	Coal-Fired Power Plant
WELBY	12/19/96	06	24	F	4.7712 ± 0.48683	0.95026	0.80089	101.2129	±	±	0.30748 ± 0.1281	0.15856 ± 0.0635	0 ± 0.00021	0 ± 0.00051	±
WELBY	12/25/96	06	24	F	1.3077 ± 0.28562	0.99223	0.0958	96.29114	±	±	0.02372 ± 0.00988	0.04678 ± 0.01873	0 ± 0.00013	0 ± 0.00029	0 ± 0.00437
WELBY	12/30/96	06	24	F	4.02055 ± 0.42887	0.95566	0.54669	118.7855	±	±	0.47143 ± 0.1964	0.36664 ± 0.14684	0 ± 0.00006	0 ± 0.00012	±
WELBY	01/02/97	06	24	F	4.6524 ± 0.47819	0.96166	0.54154	113.8358	±	±	0.65609 ± 0.27334	0.45187 ± 0.18098	0 ± 0.0001	0 ± 0.00016	0 ± 0.01367
WELBY	01/06/97	06	24	F	2.76837 ± 0.35433	0.96669	0.52827	93.4576	±	±	0.15344 ± 0.06393	0.18111 ± 0.07254	0 ± 0.00012	0 ± 0.00033	±
WELBY	01/07/97	06	24	F	3.76308 ± 0.43337	0.97468	0.38597	91.90707	±	±	0.22283 ± 0.09283	0.5987 ± 0.23979	0 ± 0.0001	0 ± 0.0004	±
WELBY	01/12/97	06	24	F	1.88707 ± 0.33574	0.98413	0.22353	94.60921	±	±	0.105 ± 0.04374	0.0179 ± 0.00717	0 ± 0.00011	0 ± 0.00025	0 ± 0.00359
WELBY	01/13/97	06	24	F	3.7837 ± 0.40947	0.9946	0.07903	88.94653	±	±	0.13839 ± 0.05766	0.02984 ± 0.01195	0 ± 0.0003	0 ± 0.00087	±
WELBY	01/15/97	06	24	F	2.00215 ± 0.30722	0.9942	0.09173	109.763	±	±	0.08148 ± 0.03394	0.03608 ± 0.01445	0 ± 0.00015	0 ± 0.00014	0 ± 0.00347
WELBY	01/16/97	06	24	F	4.6393 ± 0.48154	0.98477	0.2549	94.42807	±	±	0.29879 ± 0.12448	0.31795 ± 0.12734	0 ± 0.00026	0 ± 0.00048	±
WELBY	01/17/97	06	24	F	7.22162 ± 0.71258	0.96746	0.55554	93.46381	±	±	0.54868 ± 0.22859	0.28703 ± 0.11496	0 ± 0.00034	0 ± 0.00103	±
WELBY	01/18/97	06	24	F	5.2654 ± 0.51131	0.96237	0.6279	98.73391	±	±	0.32694 ± 0.13621	0.18735 ± 0.07504	0 ± 0.00006	0 ± 0.00043	0 ± 0.00231
WELBY	01/19/97	06	24	F	5.53705 ± 0.53019	0.9594	0.50277	114.2671	±	±	0.13638 ± 0.05682	0.17462 ± 0.06994	0 ± 0.00004	0 ± 0.00016	±
WELBY	01/20/97	06	24	F	3.89685 ± 0.42798	0.96746	0.47735	123.5797	±	±	0.37493 ± 0.1562	0.20119 ± 0.08058	0 ± 0.00007	0 ± 0.00024	0 ± 0.00459
WELBY	01/28/97	06	24	F	3.7568 ± 0.40818	0.95933	0.61502	93.12285	±	±	0.31709 ± 0.1321	0.83813 ± 0.33568	0 ± 0.00011	0 ± 0.00036	0 ± 0.00114
WELBY	01/30/97	06	24	F	3.04373 ± 0.38518	0.9358	0.49748	129.3888	±	±	0.13465 ± 0.0561	0.21875 ± 0.08761	0 ± 0.00003	0 ± 0.00005	0 ± 0.00825

Table C.1B-7

24-Hour Contributions to $PM_{2.5}$ Mass at Core and Satellite Sites for Individual Samples - NFRAQS Winter 1996/97, Conventional CMB

Site ID	Sample Date	Start Hour	Duration (hrs)	Size	$PM_{2.5}$ Mass ($\mu g/m^3$)	R-square	Chi-square	Percent of Mass	Light-Duty Gasoline Vehicle Exhaust	Diesel Exhaust Diesel Exhaust	Paved Road Dust	Meat Cooking and Wood Combustion	Ammonium Sulfate	Ammonium Nitrate	Coal-Fired Power Plant
CHATFR	12/26/96	06	24	F	16.4939 ± 2.313	0.98515	0.18214	90.91528	± 0	± 0	± 0	2.85297 ± 1.24543	2.78518 ± 0.36948	4.33432 ± 0.45675	0.6878 ± 1.30659
CHATFR	12/30/96	06	24	F	3.963 ± 2.3449	0.78179	0.29571	78.05833	± 0	± 0	± 0	1.6024 ± 0.80886	0.29659 ± 0.176	0.291 ± 0.20129	0.17463 ± 0.85667
CHATFR	01/01/97	06	24	F	2.747 ± 2.2716	0.65001	0.28459	84.70837	± 0	± 0	± 0	0.60156 ± 0.54922	0.08406 ± 0.14701	0.35449 ± 0.19154	0.05479 ± 0.63162
CHATFR	01/02/97	06	24	F	5.2368 ± 2.3511	0.87897	0.22442	89.063	± 0	± 0	± 0	0.99456 ± 0.70315	0.19241 ± 0.17015	0.83653 ± 0.21441	0.14115 ± 0.81526
CHATFR	01/06/97	06	24	F	5.2368 ± 2.3511	0.94732	0.15571	82.79858	± 0	± 0	± 0	0.33695 ± 0.5861	0.55577 ± 0.17174	1.17325 ± 0.22405	0.17951 ± 0.75782
CHATFR	01/07/97	06	24	F	6.5929 ± 2.2913	0.95753	0.1906	111.3134	± 0	± 0	1.1463 ± 1.03138	1.38861 ± 0.85386	0.5944 ± 0.19453	1.32436 ± 0.23278	0.115 ± 1.01535
CHATFR	01/12/97	06	24	F	12.3135 ± 2.4163	0.98467	0.16939	99.00449	± 0	± 0	0.97213 ± 1.03533	0.55867 ± 0.40352	3.25846 ± 0.36033	3.31044 ± 0.38327	± 0
CHATFR	01/16/97	06	24	F	9.5798 ± 2.3745	0.98669	0.1297	87.47671	± 0	± 0	0.1571 ± 1.06576	1.06718 ± 0.77823	2.21182 ± 0.28559	2.54366 ± 0.31459	0.128 ± 0.94104
CHATFR	01/19/97	06	24	F	4.5345 ± 2.2797	0.73297	0.19843	44.64126	± 0	± 0	± 0	0.41249 ± 0.27146	0.19772 ± 0.12904	0.43384 ± 0.19274	± 0
CHATFR	01/20/97	06	24	F	2.981 ± 2.3481	0.7494	0.2183	95.5383	± 0	± 0	± 0	1.47771 ± 0.46554	0.10709 ± 0.13387	0.25343 ± 0.19744	± 0
CHATFR	01/27/97	06	24	F	9.1844 ± 2.3774	0.96785	0.2124	65.67958	± 0	± 0	± 0	0.74176 ± 0.35407	1.53137 ± 0.2077	1.79621 ± 0.25907	± 0
CHATFR	01/28/97	06	24	F	20.74 ± 2.4933	0.96873	0.1722	77.16116	± 0	± 0	1.40463 ± 1.36079	9.47113 ± 2.50532	0.45 ± 0.25914	1.56132 ± 0.25235	0.50458 ± 1.65877
HIGHRA	12/18/96	06	24	F	5.3793 ± 0.6397	0.99073	0.13273	120.1067	± 0	± 0	1.59011 ± 0.49511	0.63875 ± 0.21942	0.77195 ± 0.09201	1.13165 ± 0.12009	± 0
HIGHRA	12/19/96	06	24	F	4.9538 ± 0.6423	0.99078	0.12627	94.94035	± 0	± 0	0.14451 ± 0.35288	0.39049 ± 0.25257	0.55402 ± 0.08147	1.29885 ± 0.12864	0.12729 ± 0.31078
HIGHRA	12/25/96	06	24	F	5.3478 ± 0.6394	0.98803	0.1832	107.5622	± 0	± 0	0.25104 ± 0.34841	0.22915 ± 0.20743	0.84883 ± 0.10732	2.07564 ± 0.19091	0.16862 ± 0.2555
HIGHRA	12/26/96	06	24	F	10.3308 ± 0.797	0.97592	0.42963	107.3495	± 0	± 0	0.71821 ± 0.53115	0.98059 ± 0.45592	1.50918 ± 0.21971	4.15077 ± 0.37618	0.45715 ± 0.45441
HIGHRA	12/30/96	06	24	F	5.2567 ± 0.6354	0.98244	0.13252	122.4861	± 0	± 0	0.67939 ± 0.5394	1.98906 ± 0.63938	0.29671 ± 0.08121	0.15392 ± 0.05337	0.0752 ± 0.50757
HIGHRA	12/31/96	06	24	F	2.7126 ± 0.5899	0.97273	0.15023	147.2845	± 0	± 0	0.31942 ± 0.38406	1.10876 ± 0.41065	0.22249 ± 0.06342	0.09882 ± 0.04939	0.27426 ± 0.35241
HIGHRA	01/01/97	06	24	F	4.0974 ± 0.6133	0.94003	0.14217	66.72315	± 0	± 0	± 0	1.07876 ± 0.3924	0.07851 ± 0.05369	0.05573 ± 0.04814	0.06068 ± 0.34913
HIGHRA	01/02/97	06	24	F	4.559 ± 0.6181	0.96687	0.22852	124.9492	± 0	± 0	0.32634 ± 0.46672	2.28257 ± 0.64926	0.13678 ± 0.07313	0.32351 ± 0.06072	0.26489 ± 0.44294
HIGHRA	01/06/97	06	24	F	5.2166 ± 0.6306	0.98347	0.23988	131.1936	± 0	± 0	0.42814 ± 0.35756	0.21935 ± 0.12494	0.69643 ± 0.08932	3.13054 ± 0.27109	± 0
HIGHRA	01/07/97	06	24	F	8.9364 ± 0.731	0.99331	0.11587	109.334	± 0	± 0	1.10615 ± 0.58882	1.24056 ± 0.4912	0.90298 ± 0.1241	2.85682 ± 0.26057	0.06286 ± 0.42313
HIGHRA	01/12/97	06	24	F	16.3454 ± 0.9988	0.95112	0.89581	93.80368	± 0	± 0	1.50492 ± 0.82789	2.35417 ± 0.6486	2.49877 ± 0.28122	3.15139 ± 0.31859	± 0
HIGHRA	01/13/97	06	24	F	35.3578 ± 1.8621	0.97117	0.54014	94.85719	± 0	± 0	1.53315 ± 1.15909	1.4054 ± 0.49523	7.23052 ± 0.78871	13.56636 ± 1.23844	± 0
HIGHRA	01/14/97	06	24	F	25.4052 ± 1.3941	0.97707	0.43101	86.73393	± 0	± 0	0.95289 ± 0.92021	1.22805 ± 0.42621	3.99031 ± 0.45913	8.93379 ± 0.80249	± 0
HIGHRA	01/15/97	06	24	F	6.8636 ± 0.6774	0.96732	0.42709	96.32978	± 0	± 0	± 0	1.20485 ± 0.31579	1.31285 ± 0.13836	0.97267 ± 0.11186	± 0
HIGHRA	01/16/97	06	24	F	10.7687 ± 0.7826	0.99249	0.12934	88.46647	± 0	± 0	0.54175 ± 0.52492	0.79369 ± 0.39653	1.93711 ± 0.23068	2.70803 ± 0.27272	0.04385 ± 0.41982
HIGHRA	01/17/97	06	24	F	19.6218 ± 1.1415	0.96427	0.63181	92.83222	± 0	± 0	0.74383 ± 0.82917	3.58034 ± 0.85913	1.57886 ± 0.22652	7.11291 ± 0.59653	± 0
HIGHRA	01/18/97	06	24	F	5.2881 ± 0.6357	0.92665	0.45687	96.65108	± 0	± 0	0.04902 ± 0.46326	1.73589 ± 0.5582	0.13362 ± 0.06615	0.25284 ± 0.05597	0.00851 ± 0.41698
HIGHRA	01/19/97	06	24	F	3.0961 ± 0.6011	0.90211	0.45611	167.4349	± 0	± 0	± 0	1.71638 ± 0.54483	0.12523 ± 0.05936	0.18822 ± 0.05226	0.05154 ± 0.36877
HIGHRA	01/20/97	06	24	F	5.7075 ± 0.6415	0.96319	0.17612	118.9875	± 0	± 0	± 0	3.09016 ± 0.69193	0.1466 ± 0.05606	0.06691 ± 0.05232	± 0
HIGHRA	01/28/97	06	24	F	5.7036 ± 0.6474	0.9842	0.18116	114.5939	± 0	± 0	0.50407 ± 0.48705	1.94473 ± 0.60343	0.40733 ± 0.08519	0.6063 ± 0.07877	0.28712 ± 0.44579
HIGHRA	01/29/97	06	24	F	3.7307 ± 0.6209	0.98583	0.19774	114.2406	± 0	± 0	0.10442 ± 0.33461	0.16341 ± 0.19428	0.96447 ± 0.10836	0.95974 ± 0.1058	0.1546 ± 0.2504
HIGHRA	01/30/97	06	24	F	2.7814 ± 0.5976	0.97668	0.10363	151.9752	± 0	± 0	± 0	1.41777 ± 0.48071	0.17449 ± 0.06024	0.06383 ± 0.04867	0.10731 ± 0.36757
CAMP	12/19/96	06	24	F	22.9975 ± 1.2771	0.94937	0.95815	90.01234	± 0	± 0	1.74735 ± 0.94538	1.52023 ± 0.48952	3.36516 ± 0.38587	5.56063 ± 0.53505	± 0
CAMP	12/25/96	06	24	F	11.1974 ± 0.7969	0.9898	0.1615	103.0331	± 0	± 0	0.23748 ± 0.63612	0.59982 ± 0.36554	1.55359 ± 0.21649	3.44415 ± 0.33299	0.11731 ± 0.42329
CAMP	12/26/96	06	24	F	35.0191 ± 1.8411	0.99067	0.18693	95.75629	± 0	± 0	4.89516 ± 1.5966	3.45073 ± 1.22494	4.01551 ± 0.49369	10.51238 ± 0.94318	0.19006 ± 0.93749
CAMP	12/30/96	06	24	F	15.3541 ± 0.9478	0.97513	0.34234	102.7761	± 0	± 0	3.5881 ± 0.95963	4.35497 ± 1.16469	0.80651 ± 0.14535	1.11295 ± 0.13034	0.11913 ± 0.68611
CAMP	01/01/97	06	24	F	21.0327 ± 1.1869	0.98366	0.28515	89.92791	± 0	± 0	2.41013 ± 1.19872	3.19727 ± 1.05907	1.07345 ± 0.18531	3.46416 ± 0.33613	0.5944 ± 0.69468
CAMP	01/02/97	06	24	F	24.532 ± 1.3628	0.94845	0.72997	103.0572	± 0	± 0	5.37943 ± 1.4779	5.70393 ± 1.57726	0.74468 ± 0.21717	2.6821 ± 0.28994	0.91201 ± 0.98006
CAMP	01/06/97	06	24	F	11.7135 ± 0.8199	0.98228	0.28614	96.0089	± 0	± 0	0.88839 ± 0.62997	0.64699 ± 0.25028	1.58363 ± 0.20656	3.46138 ± 0.32892	± 0
CAMP	01/07/97	06	24	F	28.3622 ± 1.5288	0.97126	0.47818	73.12263	± 0	± 0	2.24451 ± 0.87073	4.10672 ± 1.15401	1.52685 ± 0.25567	5.24559 ± 0.48299	0.27541 ± 0.75279
CAMP	01/12/97	06	24	F	17.2289 ± 1.0659	0.98741	0.20169	83.91831	± 0	± 0	1.18112 ± 0.74511	0.38296 ± 0.20155	2.91045 ± 0.31715	3.4078 ± 0.34608	± 0
CAMP	01/13/97	06	24	F	37.0282 ± 1.9309	0.9641	0.65657	99.0966	± 0	± 0	2.95832 ± 1.32732	1.06302 ± 0.42632	8.17702 ± 0.90673	13.05469 ± 1.23363	± 0
CAMP	01/14/97	06	24	F	34.5076 ± 1.8201	0.93845	1.26543	101.6282	± 0	± 0	2.85352 ± 1.566	1.81459 ± 0.65591	6.76035 ± 0.76652	11.68751 ± 1.09759	± 0
CAMP	01/15/97	06	24	F	9.3758 ± 0.7309	0.9924	0.12251	100.8858	± 0	± 0	0.46394 ± 0.66025	0.64628 ± 0.36111	1.72009 ± 0.19115	1.73738 ± 0.18432	0.13546 ± 0.40189
CAMP	01/16/97	06	24	F	17.3921 ± 1.0384	0.98556	0.29293	117.5822	± 0	± 0	2.0445 ± 1.03958	0.76818 ± 0.45528	4.12098 ± 0.45464	5.6248 ± 0.54995	0.40971 ± 0.49752
CAMP	01/17/97	06	24	F	33.9358 ± 1.789	0.98896	0.21282	111.3536	± 0	± 0	4.21856 ± 2.05558	2.49709 ± 1.12376	3.73363 ± 0.51929	12.00214 ± 1.05964	0.06707 ± 0.95601
CAMP	01/27/97	06	24	F	14.7439 ± 0.9061	0.98119	0.32853	96.30502	± 0	± 0	1.64289 ± 0.72438	0.18111 ± 0.28906	2.70707 ± 0.36461	4.42983 ± 0.44732	0.4121 ± 0.36395
CAMP	01/28/97	06	24	F	24.8099 ± 1.3435	0.96986	0.48498	96.44233	± 0	± 0	4.4067 ± 1.18202	7.23301 ± 1.83071	1.35774 ± 0.24922	3.696 ± 0.36005	0.09759 ± 0.99635
CAMP	01/30/97	06	24	F	15.7674 ± 0.9594	0.9776	0.18487	98.10446	± 0	± 0	1.22286 ± 0.70947	6.83367 ± 1.68452	0.34817 ± 0.14992	0.3056 ± 0.07861	0.31199 ± 0.88897

Table C.1B-7 (continued)
24-Hour Contributions to $PM_{2.5}$ Mass at Core and Satellite Sites for Individual Samples - NFRAQS Winter 1996/97, Conventional CMB

Site ID	Sample Date	Start Hour	Duration (hrs)	Size	$PM_{2.5}$ Mass ($\mu g/m^3$)	R-square	Chi-square	Percent of Mass	Light-Duty Gasoline Vehicle Exhaust	Diesel Exhaust Diesel Exhaust	Paved Road Dust	Meat Cooking and Wood Combustion	Ammonium Sulfate	Ammonium Nitrate	Coal-Fired Power Plant
WELBY	12/19/96	06	24	F	17.376 ± 1.01896	0.95026	0.80089	101.2129	± 0	± 0	1.62437 ± 0.88279	1.66894 ± 0.49921	2.10633 ± 0.30915	5.05155 ± 0.52495	± 0
WELBY	12/25/96	06	24	F	7.1881 ± 0.59446	0.99223	0.0958	96.29114	± 0	± 0	0.12531 ± 0.39579	0.49236 ± 0.28116	1.33401 ± 0.20009	2.90235 ± 0.30993	0.14926 ± 0.32355
WELBY	12/30/96	06	24	F	11.4999 ± 0.73761	0.95566	0.54669	118.7855	± 0	± 0	2.49052 ± 0.79359	3.85922 ± 0.87969	0.58291 ± 0.10199	1.19124 ± 0.1438	± 0
WELBY	01/02/97	06	24	F	15.3926 ± 0.93489	0.96166	0.54154	113.8358	± 0	± 0	3.46608 ± 1.01896	4.7563 ± 1.26725	1.0277 ± 0.18063	1.60005 ± 0.19096	0.46719 ± 0.75569
WELBY	01/06/97	06	24	F	11.93157 ± 0.76177	0.96669	0.52827	93.4576	± 0	± 0	0.81063 ± 0.62921	1.90634 ± 0.49657	1.16772 ± 0.15379	3.33494 ± 0.32236	± 0
WELBY	01/07/97	06	24	F	18.96835 ± 1.09868	0.97468	0.38597	91.90707	± 0	± 0	1.17721 ± 1.04806	6.30185 ± 1.32358	0.97821 ± 0.15383	3.97126 ± 0.37792	± 0
WELBY	01/12/97	06	24	F	7.41025 ± 0.59905	0.98413	0.22353	94.60921	± 0	± 0	0.55469 ± 0.46841	0.18844 ± 0.17558	1.08861 ± 0.14235	2.51904 ± 0.25452	0.1228 ± 0.24582
WELBY	01/13/97	06	24	F	20.13765 ± 1.12177	0.9946	0.07903	88.94653	± 0	± 0	0.73113 ± 0.6325	0.31408 ± 0.16203	2.9573 ± 0.43845	8.72131 ± 0.82721	± 0
WELBY	01/15/97	06	24	F	6.09025 ± 0.53222	0.9942	0.09173	109.763	± 0	± 0	0.43044 ± 0.48241	0.37973 ± 0.25014	1.54111 ± 0.16284	1.38034 ± 0.15487	0.11842 ± 0.31172
WELBY	01/16/97	06	24	F	19.2927 ± 1.13329	0.98477	0.2549	94.42807	± 0	± 0	1.57848 ± 0.96339	3.34673 ± 0.8578	2.63881 ± 0.31677	4.79439 ± 0.49235	± 0
WELBY	01/17/97	06	24	F	31.70785 ± 1.75767	0.96746	0.55554	93.46381	± 0	± 0	2.89863 ± 1.48514	3.02123 ± 0.87987	3.43377 ± 0.48619	10.30959 ± 0.97262	± 0
WELBY	01/18/97	06	24	F	16.4215 ± 0.93644	0.96237	0.6279	98.73391	± 0	± 0	1.72719 ± 1.06237	1.97206 ± 0.77875	0.59147 ± 0.12733	4.29643 ± 0.399	0.07886 ± 0.62989
WELBY	01/19/97	06	24	F	11.37932 ± 0.74891	0.9594	0.50277	114.2671	± 0	± 0	0.72047 ± 1.05128	1.83807 ± 0.57041	0.42683 ± 0.08932	1.62277 ± 0.18727	± 0
WELBY	01/20/97	06	24	F	10.60647 ± 0.73127	0.96746	0.47735	123.5797	± 0	± 0	1.98071 ± 0.74022	2.11769 ± 0.66367	0.67941 ± 0.12566	2.3816 ± 0.24853	0.15699 ± 0.53216
WELBY	01/28/97	06	24	F	21.2587 ± 1.22827	0.95933	0.61502	93.12285	± 0	± 0	1.67515 ± 0.6808	8.82201 ± 2.06666	1.10331 ± 0.22112	3.63107 ± 0.38016	0.03907 ± 1.09358
WELBY	01/30/97	06	24	F	6.85313 ± 0.68635	0.9358	0.49748	129.3888	± 0	± 0	0.71135 ± 0.58993	2.3025 ± 0.69406	0.31953 ± 0.10415	0.53938 ± 0.12718	0.28186 ± 0.55139

Table C.1B-8
24-Hour Contributions to Elemental Carbon at Core and Satellite Sites for Individual Samples - NFRAQS Winter 1996/97, Conventional CMB

Site ID	Sample Date	Start Hour	Duration (hrs)	Size	Elemental Carbon (µg/m^3)	R-square	Chi-square	Percent of Mass	Light-Duty Gasoline Vehicle Exhaust	Diesel Exhaust Diesel Exhaust	Paved Road Dust	Meat Cooking and Wood Combustion	Ammonium Sulfate	Ammonium Nitrate	Coal-Fired Power Plant
CHATFR	12/26/96	06	24	F	0.8851 ± 0.5829	0.98515	0.18214	90.91528	±	±	±	0.02199 ± 0.02532	0 ± 0.00028	0 ± 0.00043	0.02941 ± 0.02127
CHATFR	12/30/96	06	24	F	0 ± 0.4169	0.78179	0.29571	78.05833	±	±	±	0.01235 ± 0.01422	0 ± 0.00003	0 ± 0.00003	0.00747 ± 0.0054
CHATFR	01/01/97	06	24	F	0 ± 0.4276	0.65001	0.28459	84.70837	±	±	±	0.00464 ± 0.00534	0 ± 0.00001	0 ± 0.00004	0.00234 ± 0.00169
CHATFR	01/02/97	06	24	F	0.3931 ± 0.4878	0.87897	0.22442	89.063	±	±	±	0.00767 ± 0.00883	0 ± 0.00002	0 ± 0.00008	0.00604 ± 0.00437
CHATFR	01/06/97	06	24	F	0.3453 ± 0.4717	0.94732	0.15571	82.79858	±	±	±	0.0026 ± 0.00299	0 ± 0.00006	0 ± 0.00012	0.00768 ± 0.00555
CHATFR	01/07/97	06	24	F	1.4171 ± 0.4131	0.95753	0.1906	111.3134	±	±	0.8597 ± 0.11769	0.0107 ± 0.01232	0 ± 0.00006	0 ± 0.00013	0.00492 ± 0.00356
CHATFR	01/12/97	06	24	F	1.332 ± 0.4266	0.98467	0.16939	99.00449	±	±	0.72908 ± 0.09981	0.00431 ± 0.00496	0 ± 0.00033	0 ± 0.00033	±
CHATFR	01/16/97	06	24	F	0.6103 ± 0.5258	0.98669	0.1297	87.47671	±	±	0.11782 ± 0.01613	0.00822 ± 0.00947	0 ± 0.00022	0 ± 0.00025	0.00547 ± 0.00396
CHATFR	01/19/97	06	24	F	0 ± 0.4005	0.73297	0.19843	44.64126	±	±	±	0.00318 ± 0.00366	0 ± 0.00002	0 ± 0.00004	±
CHATFR	01/20/97	06	24	F	0 ± 0.4876	0.7494	0.2183	95.5383	±	±	±	0.01139 ± 0.01311	0 ± 0.00001	0 ± 0.00003	±
CHATFR	01/27/97	06	24	F	0.0778 ± 0.5824	0.96785	0.2124	65.67958	±	±	±	0.00572 ± 0.00658	0 ± 0.00015	0 ± 0.00018	±
CHATFR	01/28/97	06	24	F	1.5681 ± 0.4146	0.96873	0.1722	77.16116	±	±	1.05345 ± 0.14421	0.07299 ± 0.08405	0 ± 0.00005	0 ± 0.00016	0.02158 ± 0.01561
HIGHRA	12/18/96	06	24	F	1.6784 ± 0.1864	0.99073	0.13273	120.1067	±	±	1.19255 ± 0.16325	0.00492 ± 0.00567	0 ± 0.00008	0 ± 0.00011	±
HIGHRA	12/19/96	06	24	F	0.5921 ± 0.1103	0.99078	0.12627	94.94035	±	±	0.10838 ± 0.01484	0.00301 ± 0.00347	0 ± 0.00006	0 ± 0.00013	0.00544 ± 0.00394
HIGHRA	12/25/96	06	24	F	0.5154 ± 0.1061	0.98803	0.1832	107.5622	±	±	0.18827 ± 0.02577	0.00177 ± 0.00203	0 ± 0.00008	0 ± 0.00021	0.00721 ± 0.00522
HIGHRA	12/26/96	06	24	F	1.229 ± 0.1504	0.97592	0.42963	107.3495	±	±	0.53865 ± 0.07374	0.00756 ± 0.0087	0 ± 0.00015	0 ± 0.00042	0.01955 ± 0.01414
HIGHRA	12/30/96	06	24	F	1.3076 ± 0.1567	0.98244	0.13252	122.4861	±	±	0.50953 ± 0.06975	0.01533 ± 0.01765	0 ± 0.00003	0 ± 0.00002	0.00322 ± 0.00233
HIGHRA	12/31/96	06	24	F	0.6275 ± 0.1123	0.97273	0.15023	147.2845	±	±	0.23956 ± 0.03279	0.00855 ± 0.00984	0 ± 0.00002	0 ± 0.00001	0.01173 ± 0.00848
HIGHRA	01/01/97	06	24	F	0.1727 ± 0.1337	0.94003	0.14217	66.72315	±	±	±	0.00831 ± 0.00957	0 ± 0.00001	0 ± 0.00001	0.00259 ± 0.00188
HIGHRA	01/02/97	06	24	F	0.7874 ± 0.1229	0.96687	0.22852	124.9492	±	±	0.24475 ± 0.03351	0.01759 ± 0.02026	0 ± 0.00001	0 ± 0.00003	0.01133 ± 0.00819
HIGHRA	01/06/97	06	24	F	0.8445 ± 0.1245	0.98347	0.23988	131.1936	±	±	0.32109 ± 0.04396	0.00169 ± 0.00195	0 ± 0.00007	0 ± 0.00031	±
HIGHRA	01/07/97	06	24	F	1.5926 ± 0.1799	0.99331	0.11587	109.334	±	±	0.8296 ± 0.11357	0.00956 ± 0.01101	0 ± 0.00009	0 ± 0.00029	0.00269 ± 0.00194
HIGHRA	01/12/97	06	24	F	2.0676 ± 0.2184	0.95112	0.89581	93.80368	±	±	1.12866 ± 0.15451	0.01814 ± 0.02089	0 ± 0.00025	0 ± 0.00032	±
HIGHRA	01/13/97	06	24	F	2.7272 ± 0.2745	0.97117	0.54014	94.85719	±	±	1.14984 ± 0.15741	0.01083 ± 0.01247	0 ± 0.00072	0 ± 0.00136	±
HIGHRA	01/14/97	06	24	F	2.0521 ± 0.2174	0.97707	0.43101	86.73393	±	±	0.71465 ± 0.09783	0.00946 ± 0.0109	0 ± 0.0004	0 ± 0.00089	±
HIGHRA	01/15/97	06	24	F	0.7399 ± 0.1169	0.96732	0.42709	96.32978	±	±	±	0.00929 ± 0.01069	0 ± 0.00013	0 ± 0.0001	±
HIGHRA	01/16/97	06	24	F	1.1406 ± 0.1454	0.99249	0.12934	88.46647	±	±	0.4063 ± 0.05562	0.00612 ± 0.00704	0 ± 0.00019	0 ± 0.00027	0.00188 ± 0.00136
HIGHRA	01/17/97	06	24	F	1.6608 ± 0.1835	0.96427	0.63181	92.83222	±	±	0.55786 ± 0.07637	0.02759 ± 0.03177	0 ± 0.00016	0 ± 0.00071	±
HIGHRA	01/18/97	06	24	F	0.714 ± 0.1169	0.92665	0.45687	96.65108	±	±	0.03677 ± 0.00503	0.01338 ± 0.0154	0 ± 0.00001	0 ± 0.00003	0.00036 ± 0.00026
HIGHRA	01/19/97	06	24	F	0.3081 ± 0.0977	0.90211	0.45611	167.4349	±	±	±	0.01323 ± 0.01523	0 ± 0.00001	0 ± 0.00002	0.0022 ± 0.00159
HIGHRA	01/20/97	06	24	F	0.7891 ± 0.1215	0.96319	0.17612	118.9875	±	±	±	0.02382 ± 0.02742	0 ± 0.00001	0 ± 0.00001	±
HIGHRA	01/28/97	06	24	F	1.0469 ± 0.1377	0.9842	0.18116	114.5939	±	±	0.37804 ± 0.05175	0.01499 ± 0.01726	0 ± 0.00004	0 ± 0.00006	0.01228 ± 0.00888
HIGHRA	01/29/97	06	24	F	0.4803 ± 0.1036	0.98583	0.19774	114.2406	±	±	0.07831 ± 0.01072	0.00126 ± 0.00145	0 ± 0.0001	0 ± 0.0001	0.00661 ± 0.00478
HIGHRA	01/30/97	06	24	F	0.4628 ± 0.1038	0.97668	0.10363	151.9752	±	±	±	0.01093 ± 0.01258	0 ± 0.00002	0 ± 0.00001	0.00459 ± 0.00332
CAMP	12/19/96	06	24	F	3.3195 ± 0.328	0.94937	0.95815	90.01234	±	±	1.31048 ± 0.1794	0.01172 ± 0.01349	0 ± 0.00034	0 ± 0.00056	±
CAMP	12/25/96	06	24	F	1.4471 ± 0.1709	0.9898	0.1615	103.0331	±	±	0.1781 ± 0.02438	0.00462 ± 0.00532	0 ± 0.00016	0 ± 0.00034	0.00502 ± 0.00363
CAMP	12/26/96	06	24	F	6.1607 ± 0.585	0.99067	0.18693	95.75629	±	±	3.67129 ± 0.50258	0.02659 ± 0.03062	0 ± 0.0004	0 ± 0.00105	0.00813 ± 0.00588
CAMP	12/30/96	06	24	F	4.1377 ± 0.4	0.97513	0.34234	102.7761	±	±	2.69101 ± 0.36839	0.03356 ± 0.03865	0 ± 0.00008	0 ± 0.00011	0.00509 ± 0.00368
CAMP	01/01/97	06	24	F	3.6325 ± 0.3562	0.98366	0.28515	89.92791	±	±	1.80756 ± 0.24745	0.02464 ± 0.02837	0 ± 0.00011	0 ± 0.00035	0.02542 ± 0.01839
CAMP	01/02/97	06	24	F	6.5019 ± 0.6162	0.94845	0.72997	103.0572	±	±	4.03448 ± 0.5523	0.04396 ± 0.05062	0 ± 0.00007	0 ± 0.00027	0.039 ± 0.02821
CAMP	01/06/97	06	24	F	1.6635 ± 0.1834	0.98228	0.28614	96.0089	±	±	0.66627 ± 0.09121	0.00499 ± 0.00574	0 ± 0.00016	0 ± 0.00035	±
CAMP	01/07/97	06	24	F	3.4968 ± 0.3489	0.97126	0.47818	73.12263	±	±	1.68334 ± 0.23044	0.03165 ± 0.03644	0 ± 0.00015	0 ± 0.00052	0.01178 ± 0.00852
CAMP	01/12/97	06	24	F	1.8204 ± 0.1968	0.98741	0.20169	83.91831	±	±	0.88582 ± 0.12126	0.00295 ± 0.0034	0 ± 0.00029	0 ± 0.00034	±
CAMP	01/13/97	06	24	F	3.8704 ± 0.3783	0.9641	0.65657	99.0966	±	±	2.21869 ± 0.30373	0.00819 ± 0.00943	0 ± 0.00082	0 ± 0.00131	±
CAMP	01/14/97	06	24	F	4.6189 ± 0.4447	0.93845	1.26543	101.6282	±	±	2.14009 ± 0.29297	0.01399 ± 0.0161	0 ± 0.00068	0 ± 0.00117	±
CAMP	01/15/97	06	24	F	1.2992 ± 0.1608	0.9924	0.12251	100.8858	±	±	0.34795 ± 0.04763	0.00498 ± 0.00574	0 ± 0.00017	0 ± 0.00017	0.00579 ± 0.00419
CAMP	01/16/97	06	24	F	3.0742 ± 0.3057	0.98556	0.29293	117.5822	±	±	1.53334 ± 0.20991	0.00592 ± 0.00682	0 ± 0.00041	0 ± 0.00056	0.01752 ± 0.01267
CAMP	01/17/97	06	24	F	6.384 ± 0.6041	0.98896	0.21282	111.3536	±	±	3.16385 ± 0.43312	0.01925 ± 0.02216	0 ± 0.00037	0 ± 0.0012	0.00287 ± 0.00207
CAMP	01/27/97	06	24	F	2.2532 ± 0.234	0.98119	0.32853	96.30502	±	±	1.23214 ± 0.16867	0.0014 ± 0.00161	0 ± 0.00027	0 ± 0.00044	0.01762 ± 0.01275
CAMP	01/28/97	06	24	F	5.0961 ± 0.4874	0.96986	0.48498	96.44233	±	±	3.30495 ± 0.45243	0.05574 ± 0.06419	0 ± 0.00014	0 ± 0.00037	0.00417 ± 0.00302
CAMP	01/30/97	06	24	F	2.5337 ± 0.2585	0.9776	0.18487	98.10446	±	±	0.91712 ± 0.12555	0.05267 ± 0.06064	0 ± 0.00003	0 ± 0.00003	0.01334 ± 0.00965

Table C.1B-8 (continued)
24-Hour Contributions to Elemental Carbon at Core and Satellite Sites for Individual Samples - NFRAQS Winter 1996/97, Conventional CMB

Site ID	Sample Date	Start Hour	Duration (hrs)	Size	Elemental Carbon (µg/m^3)	R-square	Chi-square	Percent of Mass	Light-Duty Gasoline Vehicle Exhaust	Diesel Exhaust Diesel Exhaust	Paved Road Dust	Meat Cooking and Wood Combustion	Ammonium Sulfate	Ammonium Nitrate	Coal-Fired Power Plant
WELBY	12/19/96	06	24	F	2.86947 ± 0.31275	0.95026	0.80089	101.2129	±	±	1.21825 ± 0.16677	0.01286 ± 0.01481	0 ± 0.00021	0 ± 0.00051	±
WELBY	12/25/96	06	24	F	0.47708 ± 0.17364	0.99223	0.0958	96.29114	±	±	0.09398 ± 0.01287	0.00379 ± 0.00437	0 ± 0.00013	0 ± 0.00029	0.00638 ± 0.00462
WELBY	12/30/96	06	24	F	3.23705 ± 0.34375	0.95566	0.54669	118.7855	±	±	1.86784 ± 0.2557	0.02974 ± 0.03425	0 ± 0.00006	0 ± 0.00012	±
WELBY	01/02/97	06	24	F	4.15957 ± 0.45846	0.96166	0.54154	113.8358	±	±	2.5995 ± 0.35586	0.03666 ± 0.04221	0 ± 0.0001	0 ± 0.00016	0.01998 ± 0.01445
WELBY	01/06/97	06	24	F	1.48633 ± 0.21224	0.96669	0.52827	93.4576	±	±	0.60796 ± 0.08323	0.01469 ± 0.01692	0 ± 0.00012	0 ± 0.00033	±
WELBY	01/07/97	06	24	F	2.12805 ± 0.27437	0.97468	0.38597	91.90707	±	±	0.88288 ± 0.12086	0.04857 ± 0.05592	0 ± 0.0001	0 ± 0.0004	±
WELBY	01/12/97	06	24	F	0.83928 ± 0.21806	0.98413	0.22353	94.60921	±	±	0.41601 ± 0.05695	0.00145 ± 0.00167	0 ± 0.00011	0 ± 0.00025	0.00525 ± 0.0038
WELBY	01/13/97	06	24	F	1.42998 ± 0.20444	0.9946	0.07903	88.94653	±	±	0.54833 ± 0.07506	0.00242 ± 0.00279	0 ± 0.0003	0 ± 0.00087	±
WELBY	01/15/97	06	24	F	0.87157 ± 0.17632	0.9942	0.09173	109.763	±	±	0.32282 ± 0.04419	0.00293 ± 0.00337	0 ± 0.00015	0 ± 0.00014	0.00506 ± 0.00366
WELBY	01/16/97	06	24	F	2.2313 ± 0.2801	0.98477	0.2549	94.42807	±	±	1.18384 ± 0.16206	0.02579 ± 0.0297	0 ± 0.00026	0 ± 0.00048	±
WELBY	01/17/97	06	24	F	4.27308 ± 0.47271	0.96746	0.55554	93.46381	±	±	2.17392 ± 0.2976	0.02328 ± 0.02681	0 ± 0.00034	0 ± 0.00103	±
WELBY	01/18/97	06	24	F	2.91668 ± 0.31329	0.96237	0.6279	98.73391	±	±	1.29536 ± 0.17733	0.0152 ± 0.0175	0 ± 0.00006	0 ± 0.00043	0.00337 ± 0.00244
WELBY	01/19/97	06	24	F	2.35965 ± 0.28406	0.9594	0.50277	114.2671	±	±	0.54034 ± 0.07397	0.01417 ± 0.01631	0 ± 0.00004	0 ± 0.00016	±
WELBY	01/20/97	06	24	F	2.90263 ± 0.32398	0.96746	0.47735	123.5797	±	±	1.4855 ± 0.20336	0.01632 ± 0.01879	0 ± 0.00007	0 ± 0.00024	0.00671 ± 0.00486
WELBY	01/28/97	06	24	F	2.41727 ± 0.27704	0.95933	0.61502	93.12285	±	±	1.25634 ± 0.17199	0.06799 ± 0.07829	0 ± 0.00011	0 ± 0.00036	0.00167 ± 0.00121
WELBY	01/30/97	06	24	F	1.70107 ± 0.28446	0.9358	0.49748	129.3888	±	±	0.5335 ± 0.07303	0.01775 ± 0.02043	0 ± 0.00003	0 ± 0.00005	0.01205 ± 0.00872