APPENDIX M:

RESPONSE TO REVIEW COMMENTS ON THE APRIL 30, 2003, DRAFT REPORT

Appendix M: Response to Review Comments on the April 30, 2003, Draft Report

A draft of this report, dated April 30, 2003, was sent to the U.S. EPA Office of Air Quality Planning and Standards (OAQPS) covering source apportionment and back trajectory analyses done for the following eight sites: Bronx, New York; St. Louis, Missouri; Houston, Texas; Washington, D.C.; Milwaukee, Wisconsin; Birmingham, Alabama; Charlotte, North Carolina; and Indianapolis, Indiana. The report was distributed to internal and external reviewers, five of whom returned written comments to EPA. The table below summarizes the comments and the authors' response or planned disposition for each comment.

Reviewers were:

1. **Shelly Eberly,** U.S. EPA, OAQPS

2. **Dirk Felton,** NYSDEC (New York State Department of Environmental Conservation)

3. **John Kent,** Meteorologist, NYSDEC
   (John's comments were forwarded to EPA by Dirk Felton, NYSDEC)

4. **Matt Fraser,** Assistant Professor, Civil and Environmental Engineering
   Rice University; 6100 Main Street; Houston, Texas 77005.
   phone (713)348-5883 fax (713)348-5203 Email: mpf@rice.edu
   (Matt's comments were forwarded to EPA by Ed Michel, Texas Commission on Environmental Quality, EMICHEL@tceq.state.tx.us)

5. **William Adamski,** Bureau of Air Management, Wisconsin Department of Natural Resources; P.O. Box 7921; AM/7; Madison, Wisconsin 53707.
   phone (608)266-2660 fax (608)267-0560 Email: william.adamski@dnr.state.wi.us

6. **Unknown Reviewer.**

Summary of Response to Peer Review Comments on Eight-Site Source Apportionment of PM2.5 Speciation Trends Data

Page number references are relative to April 30, 2003, draft report.

Reviewer	Order	Page(s)	Reviewer Comment	Authors' Response
Shelly Eberly, OAQPS	01		Need explanation of source contribution function and incremental probabilities. Explanation in mathematical/probabilistic and textual terms. Pros and cons of each approach. This likely is covered in other reports, but these summary plots of the Medusa plots are too important not to have some [in] the report complete with such details.	Text added.
Shelly Eberly, OAQPS	02	E-21 Fig E-29	Typo on [E]-21. Wrong plot dropped in. Should be Bronx. Plot is for Birmingham.	Figure replaced.
Shelly Eberly, OAQPS	03		Need a table showing the time period covered for each of the sites. Now have to infer from the time series plots. Include in Data section.	Table added.
Shelly Eberly, OAQPS	04		Regarding time periods covered, I think there are some sites where non-equal number of seasons is represented. For example, DC looks to run from about 4/1/01 to 9/1/02. This means there are 2 hot seasons and only one cold season. Comment/caveat the interpretation of average source strengths and summary of Medusa plots when there are unequal reps of quarters. I'm particularly concerned about the source strength impact. We are overstating the contribution from the sources with higher summer signals.	Caveats / user warnings added to Exec sum and each subsection in Section 7.
Shelly Eberly, OAQPS	05	Apx D-K	In a perfect world, I'd like the plots in the appendices reorganized. Currently each source in each site takes 5 pages to show all the graphics. What I propose will take 3 pages. Page 1 would have the profile, the time series, and the bar charts of the time series. To me, this is the basic info from PMF where the bar charts help see patterns in the time series better. Page 2 would have 4 panels: pollution rose, Medusa, source contribution function, and incremental probabilities. This page has the source "location" information. Page 3 would have the relationships of the contributions with the temperature (by season) and pressure. This page is trying to tease out relationships between met and contribution. Also, I have all 3 pages oriented portrait.	Some reorganization being done to incorporate additional graphs. Some error bars to be added. Everything turned portrait.
Shelly Eberly, OAQPS	06		At some point we should consider eliminating the "extreme" events, like the Canadian fire and fireworks. I know with 1+ year of data, it's tough to find outliers, but some of these are really obvious. By eliminating these extremes, other signals (namely ag burning, forest fires, ...) will become clearer.	This was discussed at the beginning of the project and tabled until "next time."

Reviewer	Order	Page(s)	Reviewer Comment	Authors' Response
Shelly Eberly, OAQPS	07	viii, xi, 21	In Exec Summary, it is stated that gas/diesel can't be split due to the available data. What do you need to apportion gas/diesel? And some confusion later when it's stated that lead in St. Louis mobile proves that you could do gas/diesel split. And some confusion later in DC when you say crustal contains diesel components.	Text clarified to indicate general properties versus site-specific instances. Speciate organics would help considerably in splitting gas and diesel mobile components.
Shelly Eberly, OAQPS	08		From some stuff Homolya has given me as well as comments from Bachmann, it's expected for there to be nickel and vanadium in coal combustion. So you need more than the presence of Ni/V to conclude oil combustion. Maybe ratios of Ni/V can help decide whether source is coal or oil.	Ni and V are traditional tracers for oil burning. The flagged sources were intended to indicate a mix of oil and coal or just coal. Additional analyses have added a twist to this issue.
Shelly Eberly, OAQPS	09		Why is there little or no nitrate in the mobile profiles? Where is all the NOx from motor vehicles going in the source apportionment?	Mobile sources are year-round and the summer portions do not include nitrate. Hence, the entire profile should not include nitrate. The seasonality of the formation of nitrate forces it to show up as a separate source. Additional analyses have added to this issue.
Shelly Eberly, OAQPS	10	10, 62	Typo in References. Should be Willis, not Wills. Typo in the text when this report is referenced, too. Also, add references for AQS and SPECIATE.	Thanks for the catch! References added for AQS and Speciate.
Shelly Eberly, OAQPS	11	1 to 6	Section 2. (a) Again, tell time frame for each site. (b) Table 2.1 has a column labeled "Days". What is this? # days with non-missing data? (c) According to Homolya, sulfate and sulfur measure the same thing, and in some of the recent publications, authors are using one or the other. So is difference between sulfur and sulfate just measurement error? We probably need to visit with RTI/Homolya more on this. (d) adding species does NOT always increase the number of sources that can be found. See Paatero's "Noisy" paper. (e) Why have total mass count twice in the fitting process? Pros? Cons??	A & b) Table modified to indicate time frame and number of modeled days. c) Technically they do not measure the same thing. From a practical point of view they do. Since this is a major component of the mass the extra weight in the regression is worth while. (And one can estimate the errors from the differences in the two apportioned values.) d) Text clarified. e) Text added.
Shelly Eberly, OAQPS	12	6 to 11	Section 3. "Data have dimension equal to # sources." This is confusing. Most would say the data have dimension equal to # sites by # species. Maybe try other wording.	Reworded – primary term is now "rank."

Reviewer	Order	Page(s)	Reviewer Comment	Authors' Response
Shelly Eberly, OAQPS	13	7 to 9	Section 3.1 (a) Define what you mean by "precise" profile info. (b) Saying both UNMIX and PMF require complete data is misleading. PMF is much more flexible in options for dealing with missing data. This general statement should go. (c) The way the data were filled in means the species vary like mass. What's the implication to the resulting sources/time series of filling in this way instead of simply geometric means, medians, ...?	a) Text added. b) Comments modified. However, the models both require a value for each species on each day being modeled. c) The variation with the mass is more consistent with the mass balance model than geometric means, medians, … One would expect that this results in a better fit if for no other reason than it will tend to down-weight the difference between the imputed value and the modeled value. Actual implications not known.
Shelly Eberly, OAQPS	14		The discussion about uncertainty estimates used in PMF should not be an appendix. The uncertainties are as much a part of PMF as the raw data. I'd include a table showing general magnitudes of errors to give some feel for size. Having read Appendix A, I don't have a feel for whether the errors are 3 $\mu g/m^3$ or 0.08 $\mu g/m^3$.	Text added.
Shelly Eberly, OAQPS	15		To say that you only need to get the relative errors right but not the absolute size (p A-1) means that you aren't using information about the size of Q relative to the theoretical value of Q. Why not? This is traditionally one of the primary methods used to determine if the fitting model is in the ballpark of reality. For example, I recently was working with someone whose theoretical Q was 15,000 but observed Q was 4,000. This couldn't be right. The person had done something wrong and the correction had an impact on the solution, not just on the relative magnitude of Q. I'd really like the theoretical and final Q values reported.	Multiplicative factors cancel out of the model. Table of Q values added.
Shelly Eberly, OAQPS	16	10	The fitting of the model is too important to leave as a 1 liner on P. 10. Please explain what is being done with the BIC.	Text added.
Shelly Eberly, OAQPS	17	7	I find it confusing how UNMIX was used. Says UNMIX suggests at least 6 sources, but then PMF run for 5-10 sources. Why bother with UNMIX? What insights gained? In the second paragraph of Section 3.1, I'd say that UNMIX can't find more than 7 (or is it 8?) sources, by design.	UNMIX played only a very small role at the beginning of the project. Its value was so small that it was not used for all sites. Poirot has shown how to use UNMIX to obtain more than 7 sources.

Reviewer	Order	Page(s)	Reviewer Comment	Authors' Response
Shelly Eberly, OAQPS	18	10	If the results are so sensitive to FPEAK, this means you have a lot of rotational ambiguity in your final solution. This is NOT GOOD. How do you settle on which rotation to present (namely, the FPEAK=0 one)? Any way to reduce the rotational ambiguity? Some "prior" knowledge for the profiles (via F-key) or "prior" knowledge on source strength (via G-Key)? I'd like to know how different the answers can be for different rotations that result in approximately the same Q.	No, the Q-values changed dramatically. Hence there is essentially no rotational ambiguity. – Text modified. The simulation results showed that FPEAK values other than 0 tended to degrade the solution. My experience is that they only "appear" better because the chemists interpreting the solutions are more comfortable with hard 0's rather than small random errors.
Shelly Eberly, OAQPS	19	11	Section 4.0 refers to appendices C and D. I don't think this is right for the time series. You don't provide the time series output, except in graphical form.	References corrected. The time series are only given graphically in the report. The full electronic output will also be provided on CD.
Shelly Eberly, OAQPS	20	11	Section 4.1. What is the definition of "consistent" source assignments?	Text added.
Shelly Eberly, OAQPS	21	11 to 12	Section 4.2. Might ratios of any of the trace metals help in identification? Do we know any? Relates back to my comment about Ni/V in coal combustion. Also since there is so much discussion about fireworks, might want to include fireworks in 4.2, or is the identification of this source purely by the time series?	Species-to-species ratios are very difficult to estimate reliably. Some could eventually be added to the general guidelines, but it would be premature to do so yet. Fireworks are added.
Shelly Eberly, OAQPS	22		Can we get error bars on the results? At least the errors from PMF, even though they likely underestimate true error? This would particularly help with the contributions, as they might help give perspective to whether the weekday/weekend effect is real as well as the seasonal effects.	Error bars added to the bar charts.
Dirk Felton, NYSDEC	01		This study identifies the important PM species data by apportioning major contributors to the measured mass using chemical characteristics as well as meteorological data (back trajectories and wind/pollution roses). One of the urban sites examined in this study is Bronx, NY. The analysis applied the UNMIX and PMF models to identify the potential sources. The report identifies some of the technical options used in the application of the models, although it is unclear why these options are preferred over others.	The options are chosen by the modeler based on past experience including limited experience with simulated data. The choices have not been independently verified. Caveat added.

Reviewer	Order	Page(s)	Reviewer Comment	Authors' Response
Dirk Felton, NYSDEC	02	11	The authors note (see page 11) that two main methods were employed to identify the sources from the PMF output, one comparing with source profiles in the speciated database and the other based upon 'informed opinion.' It should be noted that the study has not identified explicitly which method was used for what source category and for which sites.	Both methods were applied to all sites and sources. Text clarified.
Dirk Felton, NYSDEC	03		The linkage between the wind/pollution roses and the source categories should be described in detail since the two approaches do not always give you information on the same spatial range.	Generally, the two should not be linked since they are on such different scales. Each plot needs to be viewed as if the scale that it represents is the correct scale for the sources.
Dirk Felton, NYSDEC	04		Some of the source categories such as fireworks or Canadian fires are not a daily occurrence. If the intent is to identify major source categories contributing to the PM2.5 mass, is there a need for the inclusion of these occasional or unusual events? Will the results and conclusions be altered if such events were excluded from the database?	The results could change, but it is not expected that they would change drastically.
Dirk Felton, NYSDEC	05		There appears to be no information on the spatial distribution of sources other than the electric energy generation units that emit both SOx and NOx. Only brief narratives are provided to describe the site selection and characteristics. Is there a defined spatial extent over which such information needs to be developed?	Identifying the spatial extent is a subgoal for the project. It was not known before hand. The utility sources are known sources of transported PM.
Dirk Felton, NYSDEC	06	35	While SOx emissions are often associated with NOx emissions from combustion processes, there are several sources of NOx emissions with essentially no SOx emissions. So the universe of NOx sources is different from that of the SOx sources. Therefore, the Figures 6.1 and 6.2 should be modified appropriately.	Neither figure claims to indicate a comprehensive set of source emissions of a particular pollutant. Rather, they are source type specific. Hence both are appropriate as they are.
Dirk Felton, NYSDEC	07	2	The text does not identify what specific periods were considered in the analysis. Perhaps Table 2.1 should include such information, in addition to simply the number of days and the frequency of sampling.	Table modified.
Dirk Felton, NYSDEC	08	viii	The executive summary identifies one of the limitations being the need for sufficient data. Assuming that the database coverage is for a year or more (corresponding to about 120 samples based on one-in-three-day sampling) how many more samples are needed to satisfy the sufficiency clause?	An exact value would depend on the number of major source types, how different they are chemically and temporally, and the species available. It is unknown what the practical lower bound would be. Three to five times the data available for this study is common used for SA.

Reviewer	Order	Page(s)	Reviewer Comment	Authors' Response
Dirk Felton, NYSDEC	09	7 to 9	It is stated in Section 3.1 that missing data were filled. What percent of the data were missing at the Bronx site? If most of the data are valid, is it preferable to keep them as missing, rather than filling-in data?	The model needs "complete" data, so missing and below MDL data must be filled in. See Table 2.1.
Dirk Felton, NYSDEC	10		In the case of Bronx, NY the authors utilized the collocated FRM-based PM2.5 mass as well as the mass obtained from the speciation sampler. Since the estimates by these two methods could agree and or differ, what rules were adopted to select the 'correct' mass? What is meant by the reconstructed mass – the IMPROVE definition?	Both mass values are used. The apportioned mass is the mean of the apportioned amounts for the two values. Definition of "reconstructed" clarified in text.
Dirk Felton, NYSDEC	11		Did the effects of the Canadian forest fires appear in the Bronx data?	The modeling for Bronx is based on an earlier time frame.
Dirk Felton, NYSDEC	12	29 to 30	The text in Sec. 6.3 refers to day of the week and season summaries. However, there is no discussion on the season summaries. In the case of weekday and weekend analysis, were both Saturday and Sunday treated together or separately?	Table added. Saturday and Sunday were treated together.
Dirk Felton, NYSDEC	13	32 to 34	In Table 6.5, the source origin for sea spray for the Bronx monitor is identified as southern PA, northern VA, Atlantic Ocean, northern IL, and northern MI. While some of these source regions can be considered as plausible, are northern IL and MI reasonable as sources for sea spray? This source appears to be a mix of sea salt, trace metals from industrial processes, etc. – perhaps it can be labeled more appropriately.	Agreed. This seems to be generally true for the Marine sources. Final identifications reflect this.
Dirk Felton, NYSDEC	14		What are the differences between sea spray, sea salt, and long-range transport of sea salt?	"Long range" is expected to include additional secondary material.
Dirk Felton, NYSDEC	15	57	Under Conclusions, it is stated that the analysis reflects the effects of strong local effects as well as that of long-range transport. What is the spatial extent/range of local sources affecting, say, the Bronx site, and what are these sources?	The source regions indicate the probable spatial extent.
John Kent, NYSDEC	01		In the discussion of the pollution roses, the document states that "winds under 1 mph" were not used "since the wind direction is not always clear for low winds". First off, wind speeds under 1 mph (rounded) are reported as calm, with no direction, so this doesn't really make sense. Second, I would argue that because "direction is not always clear for low winds", that perhaps they should have set a higher minimum threshold (4-5 mph??). Even when 1-3 mph winds are reported with a direction, in my experience the chances are low that the reported direction is representative of the overall wind flow through the area in question.	We use 1 mph the cutoff from the reported data.
John Kent, NYSDEC	02	6	Why was Teterboro Airport in NJ chosen for wind observations to represent the Bronx site? LaGuardia Airport is significantly closer to the	Our calculations show that LaGuardia airport (at a distance of 32.9 miles) is

Reviewer	Order	Page(s)	Reviewer Comment	Authors' Response
			site. Perhaps using a vector-averaged wind from the two or three closest weather observing sites could help to provide a more representative wind observation, particularly in cases of low wind speed.	farther from the monitor site than Teterboro Airport.
Matt Fraser, Rice Univ.	01	11 to 12	Section 4.2 only provides brief descriptions of the chemical composition of factors assigned to specific sources. The full data is in the appendix. Looking at the data in the appendix for Factor 2, I would think wood smoke is a much better source than fireworks. It may be true that the two sources are not entirely separated, but with the high potassium I think wood smoke is more reasonable.	Since the July 4th signal dominates the time series, the source was initially labeled as such. The source is most likely both sources combined. (Potassium is expected from both sources.)
Matt Fraser, Rice Univ.	02		Fireworks vs. biomass combustion: Are the two sources resolved?	The two are not resolved separately.
Matt Fraser, Rice Univ.	03	32 to 34	Is it possible that this should be truly biomass combustion with the July 4th peak being misinterpreted by PMF? With the data from the trajectory analysis (Table 6.5) this signature is associated with the areas where ag burning is prevalent.	Yes.
Matt Fraser, Rice Univ.	04		Shouldn't the data be broken down into seasonal datasets and PMF run on separate seasons if it appears that there is seasonal lumping of two different sources (i.e., run PMF on summer data separately from winter data).	Breaking the data into separate seasonal components might increase the chance of getting a NOx component within the mobile source. This would require much more data.
Matt Fraser, Rice Univ.	05	29 to 30	Table 6.4: Unclear why weekend trend in ammonium sulfate. No reason for this and no real explanation given.	Trend is small and could reflect "weekday" trend 1-2 days upwind.
Wm. Adamski, WDNR	01		It appears that the methods and models employed in this draft PM2.5 assessment report could be very useful in our work towards drafting Wisconsin's PM2.5 SIP [state implementation plan].	That is the hope.
Wm. Adamski, WDNR	02		The overall report appears to be fairly well organized, succinct and comprehensible. Battelle and STI have done a good job of outlining the protocol and the how some of the shortcomings and other considerations to the modeling and analysis can be reasonably addressed.	Thanks!
Wm. Adamski, WDNR	03	1 to 2	Sources of the data (Section 2.1). It is mentioned that the PM2.5 data from the Milwaukee site were obtained in September 2002. Would it possible for us to receive an electronic copy of the exact Milwaukee PM2.5 data base used in the study? We would employ these data with the study's analysis and modeling protocol and tools in order to attempt replicating the Milwaukee results contained in the report.	Electronic versions of the data and output will be made available to OAQPS.
Wm. Adamski, WDNR	04	4	Milwaukee site characteristics (Section 2.2.6). The report correctly states that the Milwaukee DNR SERHQ PM2.5 speciation sampler is located about 100 feet (to the east) from Dr. Martin Luther King, Jr. Drive. However, it	Additional information included.

Reviewer	Order	Page(s)	Reviewer Comment	Authors' Response
			should also be noted that Dr. Martin Luther King, Jr. Drive is major north-south arterial street with lots of motor vehicle traffic. Additionally, the PM2.5 monitor is located about 150 feet north of North Ave., which is a major east-west arterial street with traffic volumes perhaps even greater than for Dr. Martin Luther King, Jr. Drive. The subsequent intersection between these 2 major streets is about 125 feet southwest of the monitor and separated by the DNR building. Nevertheless, there is considerable amount of motor vehicle deceleration, idling and acceleration (with substantial emission increases) at this intersection.	
Wm. Adamski, WDNR	05	4	Additionally, Interstate 43 (north-south orientated) is located about 1000 feet west of the PM2.5 monitor. This roadway is subject to extraordinarily high motor vehicle traffic, particularly during rush hour traffic (Milwaukee's downtown is located about 2 miles south the DNR SERHQ office). Consequently, the Milwaukee PM2.5 speciation monitor is potentially exposed to a considerable amount of emissions from nearby motor vehicle traffic during certain wind direction regimes.	Additional information included.
Wm. Adamski, WDNR	06	6	Local meteorological data (Section 2.5, Table 2.2). For the Milwaukee DNR SERHQ PM2.5 site, Battelle and STI employed meteorological data obtained from Fond du Lac. The Fond du Lac meteorological monitor is located approximately 50 air miles northwest of the Milwaukee PM2.5 speciation monitor (not 33.4 miles as noted in Table 2.2). The Fond du Lac location is incorrectly noted in Table 2.2 as being the closest meteorological station to the Milwaukee PM2.5 monitor.	Text clarified to indicate that the named stations are the closest of the ones available to the authors for analysis. Also, the authors' calculations show that Fond du Lac is approximately 33.6 miles from the monitor while MKE is approximately 38.7 miles from the monitor.
Wm. Adamski, WDNR	07	6	It is obvious that there are meteorological monitoring sites much closer to the Milwaukee PM2.5 speciation monitor than Fond du Lac. These weather stations include those operated by the National Weather Service (NWS) at Milwaukee Mitchell Airport ("MKE"), Milwaukee Timmerman Field and Waukesha airport.	Our calculations indicate that Fond du Lac is closer to the Milwaukee site than Milwaukee Mitchell Airport (MKE). The authors did not have access to weather data from Milwaukee Timmerman Field or Waukesha airport.

Reviewer	Order	Page(s)	Reviewer Comment	Authors' Response
Wm. Adamski, WDNR	08	6	The weather data from the MKE NWS station would be particularly appropriate for use with the Milwaukee PM2.5 speciation monitor. That is because the Mitchell Airport is located approximately 3 miles west of Lake Michigan. The Milwaukee PM2.5 speciation monitor is also located about 3 miles west of Lake Michigan. Lake Michigan, being a huge heat sink during the spring and summer months, and a heat source during the fall and winter, often greatly modifies the weather within a few miles of the shoreline (e.g., the summertime lake breeze). Consequently, the Milwaukee PM2.5 speciation monitor often—if not usually—witnesses the same meteorology that is being measured at MKE, which located only 7 miles south of DNR SERHQ.	Calculations rechecked.
Wm. Adamski, WDNR	09	6	Would it be possible to revise the meteorological portion of the analysis of the Milwaukee PM2.5 speciation data to include weather measurements from MKE? These meteorological data would be more appropriate than those from Fond du Lac.	Was considered, but rejected because of the expected value gained.
Wm. Adamski, WDNR	10		As with an earlier request for the Milwaukee PM2.5 data base used in the study – would it possible to obtain an electronic copy of the meteorological data set used by Battelle and STI in evaluating the Milwaukee PM2.5 speciation measurements? Again, this data set would allow us to try replicating the Milwaukee results contained in the report.	See above.
Wm. Adamski, WDNR	11	19	Preliminary results of the source apportionment analyses (Section 5.0). Would it possible to provide more detailed information on the Milwaukee portion of this section (Table 5.6)? The notes and profile comments section of this table appear to be a bit too brief to be effective. For our own use we would want to obtain a copy of the full PMF runs on Milwaukee data. If they are available – preferably in an electronic format.	Electronic output will be available.
Wm. Adamski, WDNR	12	22	Pollution roses (Section 6.1). Would it be possible to re-run the pollution rose simulations for the Milwaukee PM2.5 using the more appropriate Milwaukee Mitchell airport data inputs (MKE, see comment # 4)? How would these new outputs impact the Tables and their interpretations contained in Sections 6.1 – 6.3 of the report?	Was considered, but rejected because of the expected value gained.
Wm. Adamski, WDNR	13		What is the name of the computer program that generated pollution roses? How could we obtain this program and user information?	SAS. Information can be obtained from SAS, www.sas.com. Custom code to generate the pollution roses was developed by Battelle.

Reviewer	Order	Page(s)	Reviewer Comment	Authors' Response
Wm. Adamski, WDNR	14	30 to 34 A-3 to A-6	Back Trajectory Analyses (Section 6.4, Appendix A Section A-3.3). I have run the Hybrid Single-Particle Lagrangian Integrated Trajectory (HYSPLIT) model on the internet a few times (but not the PC version). This brief HYSPLIT background also limits my comments. However, based upon the discussion in the report, we would like to try getting, then running the PC version of HYSPLIT with the appropriate data sets for the Milwaukee case. Would it possible for us to obtain an electronic copy of the data inputs to HYSPLIT for generating back trajectories that pertinent to the Milwaukee PM2.5 data. These data sets include the all the data sets described in Sections A.3.3 and A.3.5 of Appendix A.	HYSPLIT is available from NOAA:www.
Wm. Adamski, WDNR	15	A-6	Availability – trajectory output data (Appendix A Section A-3.6). It is stated that the endpoint files and plot files will be archived in a US EPA OAQPS computer directory entitled "G:\user\shared directory". How does one gain access to this directory? Is it required to have a user ID and pass code in order to access this directory?	Contact OAQPS.
Unknown Reviewer	01		As indicated by the pollution roses the secondary sulfate and ammonium nitrate source locations are consistent with utility plants located in and around the St. Louis City area. There are major utility plants located northerly, southerly, and westerly of the site, outside of St. Louis City. These plants have some of the highest emission rates of SO2 and NOx in the area. The source locations of the two species are also consistent with the expected dominant source region of the Ohio River valley. This particular region is associated with power plants that have high emission rates for SO2 and NOx. The outcome is consistent with what has been known previously regarding the likelihood of power plant impacts on fine particulate.	Additional information added to the report.
Unknown Reviewer	02		The report states that the high concentrations of sulfate in St. Louis are to some extent related to the effects of high-pressure systems. The correlation between the two seems not to be consistent as elsewhere the correlation between pressure and sulfate is shown to be slightly negative.	Text clarified. (The correlation is with high pressure systems located to east of St. Louis.)

Reviewer	Order	Page(s)	Reviewer Comment	Authors' Response
Unknown Reviewer	03		Results of mobile sources are as expected. The Blair site is bounded by areas with high Traffic Volume Count (TVC). There are major interstate highways and major traffic arteries located within the peripheral areas of the site. Emissions from these areas are likely to pose potential influence on levels of PM2.5 monitored at the site. Regional source locations for mobile extend westerly of the site, from the central to southern portion of the Missouri State through east of Kansas. This is the area through which interstates I-70 and I-40 pass. It has been indicated by 2000 data that both interstates ranged between 25,000 and 40,000 in TVC.	Additional information added to the report.
Unknown Reviewer	04		The lead component of this source category is not clearly significant. Nearby Total Suspended Particulate (TSP) sampling in the Herculaneum area shows concentrations that have been low. 2002 data show values that have ranged between 0.03 and 2.24 µg/m3 (quarterly arithmetic mean) with only two values monitored above 1.0 µg/m3. Additional lead monitoring has been conducted at the Clayton Animal Shelter site in St. Louis County. It too has monitored on average 0.1 µg/m3 of lead in all quarters of the site's monitoring years. Speciated lead impacts at Blair have been around 0.01 µg/m3 (maximum 24-hr) for any sampling event. Road dust from the Herculaneum smelter, which is located some 25-30 miles southwest of St. Louis City is an unlikely source. At this time it appears lead concentration from this smelter is not a large component of the Blair impacts.	Text clarified. The mobile sources are not major sources of lead per se, rather there is an unusually large amount of lead in the profile, ~ 6ng/m^3, that we would to be able to explain. 100-200 km is "local" for PM2.5.
Unknown Reviewer	05		Impacts of monitored zinc are indicated to extend from the north through southeast. In particular, the southeast source location is consistent with Big River Zinc Corporation located 4.8 miles in Sauget City. There are no obvious local sources to the north-northeast and east of Blair. Chemetco copper smelter, which is indicated as to influence copper concentrations appears to have been shut down. Cerro Copper Products Company on the other hand seem to be the likely source of impacts. This facility is located to the southeast of the Blair site also in Sauget City.	Additional information added to the report.
Unknown Reviewer	06		A primary question raised in review of this analysis is the extent to which local versus distantly transported emissions can be determined to impact the monitoring site. It appears that it has not been clearly identified how this would be apportioned. Based on our understanding of the process, improved inventories and analysis of monitoring on a much larger scale might be necessary to shed adequate light to determine these factors.	Additional analyses are planned.