MISSOURI
DEPARTMENT OF
NATURAL RESOURCES
Air Pollution Control Program

RECOMMENDATION FOR ADOPTION

PROPOSED REVISION TO

MISSOURI STATE IMPLEMENTATION PLAN – NONATTAINMENT AREA PLAN FOR THE 2010 1-HOUR SULFUR DIOXIDE NATIONAL AMBIENT AIR QUALITY STANDARD – JEFFERSON COUNTY SULFUR DIOXIDE NONATTAINMENT AREA

On April 30, 2015, the Missouri Air Conservation Commission held a public hearing for a revision to the Missouri State Implementation Plan (SIP) entitled – Nonattainment Area Plan for the 2010 1-Hour Sulfur Dioxide National Ambient Air Quality Standard – Jefferson County Sulfur Dioxide Nonattainment Area. A summary of comments received and the Air Program's corresponding responses is included on the following page. Revisions were made to the proposed plan as a result of comments received.

The revised plan has not been reprinted in the briefing document due to its volume. The entire revised plan is available for review at the Missouri Department of Natural Resources' Air Pollution Control Program, 1659 East Elm Street, Jefferson City, Missouri, 65101, (573)751-4817. It is also available online at http://dnr.mo.gov/env/apcp/stateplanrevisions.htm.

The Air Program recommends the commission adopt the plan as revised. If the commission adopts this plan, it will be the department's intention to submit it to the U.S. Environmental Protection Agency for inclusion in the Missouri State Implementation Plan.

COMMENTS AND RESPONSES ON

PROPOSED REVISION TO

MISSOURI STATE IMPLEMENTATION PLAN –

Nonattainment Area Plan for the 2010 1-Hour Sulfur Dioxide National Ambient Air Quality Standard - Jefferson County Sulfur Dioxide Nonattainment Area

The public comment period for the proposed revision to the Missouri State Implementation Plan (SIP) for the *Nonattainment Area Plan for the 2010 1-Hour Sulfur Dioxide National Ambient Air Quality Standard - Jefferson County Sulfur Dioxide Nonattainment Area* opened on March 25, 2015 and closed on May 7, 2015. Revisions to the proposed plan were made as a result of comments.

The following is a summary of comments received and the Missouri Department of Natural Resources' Air Pollution Control Program's (Air Program's) corresponding responses.

SUMMARY OF COMMENTS: During the public comment period for the proposed plan, the Air Program received comments from the following sources: Ameren Missouri, AECOM, the U.S. Environmental Protection Agency (EPA), Washington University School of Law Interdisciplinary Environmental Clinic on behalf of Sierra Club (Washington University), Sierra Club and two citizens. All commenters testified or were represented during the public hearing before the Missouri Air Conservation Commission (MACC) on April 30, 2015. Written comments were also received on May 7, 2015 from Ameren Missouri, EPA and Washington University. In addition, the Sierra Club submitted postcards and signatures from about 240 citizens.

COMMENT #1: Washington University commented that the draft Jefferson County nonattainment area (NAA) plan does not meet the requirements of the federal Clean Air Act (CAA) because it fails to show, based on legally allowable limits for all sources within the nonattainment area and for contributing sources nearby, that the entire nonattainment area will comply with the National Ambient Air Quality Standard (NAAQS) by the October 2018 deadline.

RESPONSE: The Jefferson County SO_2 SIP provides for attainment of the standard by the attainment date of October 2018, is administratively complete, and addresses the elements required in Clean Air Act (CAA) Section 172(c). CAA section 172(c) specifies that nonattainment area plans comply with certain requirements (e.g., attainment demonstrations, emission inventories and contingency measures) but does not prescribe how the attainment demonstration must be done. EPA interprets the CAA requirement for an attainment demonstration through non-binding guidance, which varies depending on the particular pollutant and available modeling tools. For example, EPA's latest guidance for ozone and fine particulate matter ($PM_{2.5}$) indicates that attainment demonstrations for these pollutants should show compliance at the monitoring locations, not necessarily throughout the entire nonattainment area. In addition, EPA's guidance

recommends using actual emissions, as opposed to maximum allowable emissions, for ozone and $PM_{2.5}$ attainment demonstration modeling. Though EPA's 1-hour SO_2 nonattainment SIP guidance (April 23, 2014) recommends modeling attainment throughout the NAA based on allowable emissions, the EPA also states that this guidance "imposes no binding or enforceable requirements or obligations." This guidance recognizes that each NAA "may pose unique case-specific questions relating to factors such as the characteristics of the contributing sources, meteorology, jurisdictional factors, etc." Further discussion of Jefferson County's unique situation is in the response to comments #3 and 4. No changes to the plan were made as a result of this comment.

COMMENT #2: Washington University, the Sierra Club, and several citizens commented that the proposed plan does not adequately protect public health in the nonattainment area. In addition, the Sierra Club provided postcards and signatures from about 240 citizens calling upon the DNR to create a plan that ensures protection of public health.

RESPONSE: As demonstrated by the violating monitor coming into compliance by the end of 2015, the closure of the Doe Run lead smelter protects the public in the Herculaneum area from health impacts associated with SO_2. In addition to bringing the monitor into compliance, the Jefferson County SO_2 SIP includes a mechanism to ensure that air quality throughout the nonattainment area attains and maintains the standard. The overall SIP approach will protect the health of those living throughout the Jefferson County nonattainment area as demonstrated by an accurate assessment of air quality based on current conditions in the area. The Air Program's analysis shows that the Jefferson County plan protects air quality throughout the nonattainment area, and the strategy includes an expanded SO_2 monitoring network to confirm those results and allows for future plan adjustments if needed. No changes to the plan were made as a result of this comment.

Due to the similarity in the following two comments, one response is presented.

COMMENT #3: Washington University commented that the Jefferson County SO_2 nonattainment SIP lacks a valid attainment demonstration. The following paragraph summarizes this comment:

The attainment demonstration must contain two critical elements. First, the modeling that supports the demonstration must use legally allowable emission limits for all sources within the nonattainment area and all sources outside but affecting attainment in the nonattainment area. Second, the demonstration must show that the entire nonattainment area will reach the NAAQS by the deadline. The Jefferson County SIP reflects a faulty assumption that its attainment demonstration can contain either of these two requirements but need not contain both. The SIP's "main scenario" addresses the entire nonattainment area but impermissibly uses actual, not allowable, emissions for the most significant SO_2 sources. The second "monitor centric" scenario impermissibly limits its attainment demonstration to a tiny area comprising 0.4 percent of the nonattainment area. For these reasons, the proposed emission limits for Ameren's Rush Island, Meramec, and Labadie power plants are insufficient as a control strategy for attaining the NAAQS throughout the nonattainment area. In addition, allowable emissions from non-Ameren sources outside the nonattainment area must be reduced to limits sufficient to support a valid attainment demonstration for the entire nonattainment area.

COMMENT #4: EPA commented that part of the state's analysis does not follow EPA's April 23, 2014 Guidance for 1-hour SO_2 Nonattainment Area SIP Submissions. One key concern is that the current analysis does not appear to ensure that the entire area within the nonattainment area boundary will attain the standard. In addition, EPA has concerns with the appropriateness of the emissions rates used in the air quality modeling. EPA provided data illustrating the variability in annual actual SO_2 emissions from Ameren's Labadie, Meramec and Rush Island Energy Centers. EPA recommended providing additional explanation as to why the hourly rates modeled for these sources are protective of the NAAQS in the entire nonattainment area and how the actual hourly rates modeled relate to the rates proposed on the consent agreement.

RESPONSE: The "requirement" that attainment demonstration modeling should show the entire nonattainment area will reach the NAAQS by the deadline and use legally allowable emission limits is found in guidance, and thus is non-binding as mentioned previously. The Jefferson County SO_2 SIP does contain an attainment demonstration showing the entire nonattainment area will attain and maintain the NAAQS by the deadline.

As mentioned in the response to comment #1, the Jefferson County SO_2 nonattainment area is in a unique situation in that the violating monitor will be in compliance with the standard well before the attainment date of October 2018. The Jefferson County SO_2 SIP accounts for this unique situation. The Doe Run lead smelter that was operating during the 1-hour SO_2 NAAQS boundary designation process contributed to some of the highest ambient SO_2 concentrations in the country at the nearby Mott Street monitor. In December 2013 (after the nonattainment area was finalized but before the SIP was due), the smelter ceased operations permanently, and the monitor subsequently dropped dramatically to nearly background levels. The monitor is expected to be in compliance by the end of 2015.

Since the main contribution to the violating monitor has been addressed, the Air Program shifted focus to Ameren's Rush Island Energy Center, the other large SO_2 emissions source in the nonattainment area. Rush Island is located over 10 miles from the monitor. Air dispersion modeling results, which rely on emissions and meteorological data, are most accurate near the source of emissions; moving farther away from the source, modeling results are less certain due to changing terrain and meteorological conditions over a larger area. The plan's modeling analysis includes the evaluation of several scenarios, which were necessary to more accurately determine the actual conditions occurring in the nonattainment area farther away from the Mott Street monitor. The combined results from multiple modeled scenarios demonstrate that there are no actual modeled violations of the 1-hour SO_2 standard in the nonattainment area. However, because of changing terrain and meteorological considerations, additional on-site monitoring is needed to true-up modeling results farther away from the Mott Street monitor. The intent of the plan's requirement for new SO_2 monitors near the Rush Island facility is to confirm our assessment that the nonattainment area is in compliance with the 1-hour SO_2 standard farther away from the violating monitor. No changes were made to the plan as a result of this comment.

COMMENT #5: Washington University commented that the Air Program started out developing a valid SIP but changed course for unknown reasons. The following paragraph summarizes this comment.

In October 2013, the Air Program's modeling using actual emissions showed that the Rush Island and Meramec facilities individually caused very high SO_2 concentrations. Then in April 2014, the Air Program's compliant modeling showed a 90% reduction in Rush Island's current allowable emission limit would be needed to demonstrate attainment in the SIP, along with 85% reduction in Meramec's current limits and 75% reduction in Labadie's current limits. After that, the process veered off course. The department appears to have abandoned CAA requirements for the Jefferson County SIP, but not for the Jackson County SIP as far as we can tell (yet to be published for comment). The effect of this SIP ensures Ameren's plants don't have to reduce their actual SO_2 emissions.

RESPONSE: Air dispersion modeling is a detailed, complicated process that typically involves multiple iterations and adjustments. The commenter references preliminary exploratory modeling runs from October 2013 and other runs from April 2014, all of which were performed well before any final decisions were made. We continued to refine modeling inputs and assumptions as we gained a better understanding of the air quality issues in the Jefferson County nonattainment area throughout the SIP development process. Of particular note, modeling runs performed later in the process were based on actual continuous emissions monitoring (CEMS) data where available. The October 2013 preliminary modeling showing exceedances from Rush Island and Meramec Energy Centers individually was based on the use of a static emission rate derived from the annual actual emissions and evenly distributed over each hour of the year. This static method does not account for fluctuations in normal operations and eliminates peaks and valleys in the emission rate. Using more representative hourly varying emissions from CEMS data is a better predictor of actual air quality. For both Rush Island and Meramec, modeling done later in the process based on actual hourly CEMS data shows no violations of the 1-hour SO_2 NAAQS within the nonattainment area. As discussed in previous responses to comments, the unique situation in Jefferson County called for a different approach than outlined in EPA's non-binding SIP guidance. In contrast, the Jackson County SO_2 nonattainment area is different in that the primary contributing source is still operating (Veolia Energy) and the violating monitor is still well above the 1-hour SO_2 NAAQS. The Ameren Labadie and Meramec Energy Centers will be addressed further in future implementation phases of the SO_2 standard. No changes to the plan were made as a result of this comment.

Due to the similarity in the following two comments, one response is presented.

COMMENT #6: Washington University commented that the new emission limits for the Ameren plants are based on a 24-hour block averaging period, but the SIP provides no information as to how DNR adjusted its modeled 1-hour emission rates to obtain the 24-hour block average limits in the SIP.

COMMENT #7: EPA recommended including in the SIP appendices the variability analysis performed to inform the actual hourly emissions used in the modeling.

RESPONSE AND EXPLANATION OF CHANGE: The SIP describes the technique used to derive the 24-hour block average limits in Section 6.1. The Air Program followed the methods outlined in the EPA's SO_2 NAA guidance for determining longer averaging times for new emission limitations. To establish longer averaging time limits for the three Ameren Missouri

Energy Centers, the Air Program used recent hourly recorded emissions (CEMS) to determine variability on the desired averaging time basis and applied the resulting ratio to the modeled compliant value to arrive at the final longer averaging time emission limit. As a result of these comments, the Air Program has added summary tables in Section 6.1 detailing the variability analysis used to set these longer averaging times in order to clarify and support the emission limits in the agreement for each of the three Ameren sources.

COMMENT #8: Washington University commented that the SIP states DNR performed a Reasonably Available Control Measure (RACM) analysis in compliance with the RACM Guidance but does not indicate which guidance. Moreover, the SIP merely recites that an analysis was performed; it does not include that analysis for the public or EPA to review and comment upon.

RESPONSE AND EXPLANATION OF CHANGE: The Air Program followed EPA's 1-hour SO_2 nonattainment area guidance regarding the RACM analysis requirement that "Air agencies should consider all RACM/RACT that can be implemented in light of the attainment needs for the affected area(s)." RACM consists of the closure of the primary lead smelter and the SO_2 emissions limits for Ameren's Labadie, Meramec and Rush Island facilities. As part of satisfying this requirement, the Jefferson County SO_2 plan relies on federally enforceable and permanent measures and does not rely on federal rulemakings that are anticipated to yield additional SO_2 reductions but are not yet SIP creditable without further state action. As a result of this comment, we added clarification to the RACM discussion in the Jefferson County plan.

COMMENT #9: Washington University commented that the SIP lacks effective contingency measures. The SIP lists the new Rush Island monitors as both a control strategy and contingency measure. The new monitors do not qualify as a control strategy. The monitors are also not appropriate contingency measures because they do not comport with the CAA, which requires nonattainment SIPs to contain control measures designed to bring an area into attainment by the deadline, and contingency measures to take effect afterwards if the area fails to attain the NAAQS by the deadline. Further, the consent agreement does not contain any "specific measures to be undertaken" or measures that would "take effect…without further action."

RESPONSE: Based on the plan's modeling results under current conditions, there are no violations of the 1-hour SO_2 standard in the vicinity of the Rush Island facility. Therefore the plan meets CAA requirements to provide for attainment of the standard by the attainment date. The Air Program has placed limits on the Rush Island facility as part of the plan's control strategy to reduce the potential emissions of the facility in the future. To ensure the air quality farther from the Mott Street monitor is in compliance with the standard, the Air Program is requiring the installation of a new ambient SO_2 monitoring network near the Rush Island facility. The 2015 Consent Agreement allows for adjustments of the emission limits in the event the monitors indicate an exceedance of the NAAQS. According to the EPA's SO_2 NAA guidance, "contingency measures can mean that the air agency has a comprehensive program to identify sources of violations of the SO_2 NAAQS and to undertake an 'aggressive' follow-up for compliance and enforcement, including expedited procedures for establishing enforcement consent agreements pending the adoption of the revised SIP." The Air Program's approach for the implementation of contingency measures is consistent with this guidance. No changes were made to the plan as a

result of this comment.

COMMENT #10: Washington University commented that DNR failed to make the following provisions available for public review and comment: 1) number and locations of Rush Island monitors; 2) 24-hour block average emission limits; and 3) RACM analysis.

RESPONSE: CAA 110(a)(1) and (2) and 40 CFR 51.102 require states to make SIP revisions available for reasonable public review and comment and offer opportunities to request a public hearing on these actions. The proposed Jefferson County SO_2 SIP included discussions of the 24-hour block average emission limits and RACM analysis, and the complete SIP revision package was made available for public review and comment from March 25-May 7, 2015 with a public hearing on April 30, 2015. The Air Program posts an annual monitoring network plan for public inspection. The Air Program follows federal monitor siting criteria in 40 CFR 58. The new SO_2 Special Purpose Monitors (SPM) near the Rush Island facility will be included in the Air Program's next annual monitoring network plan. The 2015 Monitoring Network Plan will be made available for a 30-day public inspection period in the June 2015 timeframe. No changes were made to the plan as a result of this comment.

COMMENT #11: Several citizens commented that MDNR has not done enough outreach to ensure citizens living in the Jefferson County nonattainment area are aware of the public health issue.

RESPONSE: As mentioned in the previous response, the CAA and EPA's associated regulations require states to provide the public with reasonable opportunity to review and submit comments and request public hearings on SIP revisions. Though additional outreach about air quality issues is not required, the Air Program strives to keep stakeholders and interested citizens informed about air regulatory efforts as time and resources allow. For instance, early in the process of determining appropriate nonattainment area boundaries for the 1-hour SO_2 standard, the Air Program conducted an open public meeting in each of the potentially affected areas in the state, including the Herculaneum area, in order to educate citizens and gather input. The Air Program has also held several special meetings on implementation of the 1-hour SO_2 standard and provides regular updates on this issue through the Air Program Advisory Forum listserv email bulletins, for which any interested citizen can register. No changes to the plan were made as a result of this comment.

COMMENT #12: A citizen commented that holding the public hearing in Jefferson City at 9:00 a.m. does not allow citizens living in the Jefferson County nonattainment area sufficient opportunity to participate.

RESPONSE: For proposed SIP revisions, the Air Program gives consideration to both written comments and oral testimony provided at public hearing. Anyone can submit written comments. The Missouri Air Conservation Commission sets their next calendar year's meeting dates and locations at the end of each year. Though we try to coordinate public hearing locations for SIP revisions based on communities that are affected, it isn't always possible due to project timelines and regulatory deadlines. No changes were made to the plan as a result of this comment.

COMMENT #13: The EPA commented that the SIP states "Sources with an impact on the nonattainment area were explicitly included in the analysis." However, the term "impact" is not defined, so it is unclear which sources may have been excluded.

RESPONSE AND EXPLANATION OF CHANGE: The Air Program evaluated all sources of SO_2 emissions identified in the Missouri Emissions Inventory System (MOEIS) that are located within 50 kilometers from the border of the NAA. MOEIS contains annual actual emissions reported by all Missouri sources with an air permit as required by 10 CSR 10-6.110 Reporting Emission Data, Emission Fees, and Process Information. A 100 ton-per-year emissions threshold was used to determine inclusion in the model. Sources with actual emissions greater than this emissions threshold were included in the model inventory. As a result of this comment, additional language has been added to Section 4.3 of the plan to further detail the evaluation process performed to determine which sources were ultimately included in the model inventory.

COMMENT #14: EPA commented that the inventory year of emission data used for this modeling analysis is not specified and should be clearly provided in the state's demonstration.

RESPONSE: The discussion of the modeled source inventory is discussed in Section 4.1 and identifies 2012 as the inventory year. No changes were made as a result of this comment.

COMMENT #15: EPA pointed out several technical issues with the meteorological data used in the modeling and suggested additional information and documentation in several areas: 1) whether onsite data used was collected under an approved QAPP and whether quality assurance procedures and audits were followed; 2) why an onsite meteorological dataset is more representative of the entire nonattainment area than National Weather Service (NWS) Data; and 3) how the determination that two meter winds were not representative was made. EPA also stated the meteorological dataset should be corrected to meet the completeness requirement for regulatory modeling.

RESPONSE AND EXPLANATION OF CHANGE: The Herculaneum onsite meteorological data used in the modeling analysis was the same dataset that was used in the Herculaneum nonattainment area SIP addressing the 2008 lead standard (approved by EPA on October 20, 2014, 79 FR 62572). Similar to the current SO_2 modeling analysis, the lead attainment demonstration relied on AERMOD. Therefore, no further analysis was performed on this meteorological data set for this SIP.

Surface meteorological data used in regulatory modeling is highly dependent on the local surface conditions and terrain. Meteorological input data should be selected based on it representativeness of the area of concern, which in this case is the area represented by the Mott Street monitor. Representativeness is dependent on proximity to the area under consideration, complexity of the terrain, exposure, and the time period of data collection. Off-site data collected by nearby NWS stations, such as Cahokia/St. Louis Downtown, which is 27 km from the nonattainment area, were evaluated. However, it was determined that the Herculaneum onsite meteorological data met these representativeness criteria for the Mott Street monitor better than data collected at distant NWS stations. This is discussed in the Section 4.6 of the plan. In addition, it was determined that the two meter winds were not representative. Documentation

was added to Section 4.6 of the plan text to justify why the two meter wind speed and wind direction measurements were excluded from the meteorological data used in the modeling analysis.

Lastly, the Air Program resolved the meteorological data error described by the EPA. The Air Program determined that an error was made in the processing of the data from its raw form to its model-ready form. One line of processing options invoking the Bulk Richardson number option for processing in Stage 3 of AERMET had been inadvertently left out of the input file. These corrections were made to the final modeling runs in the plan. The corrections do not change the department's conclusion that the control strategy ensures attainment throughout the Jefferson County nonattainment area based on an evaluation of current conditions. An explanation of these corrections was added to the SIP.

COMMENT #16: EPA commented on the background concentration analysis performed on the East St. Louis monitoring site. In particular, EPA noted that the sector chosen (east winds) as representative of background rarely has winds from this direction. EPA recommended that the latest monitoring data period without an impact from SO_2 emissions from Herculaneum lead smelter be further analyzed to determine if the 9 parts per billion (ppb) background concentration is reasonable for the entire area. EPA also recommended performing back trajectories on the highest monitored days after the smelter shut down to determine the direction from which the higher readings are originating.

RESPONSE AND EXPLANATION OF CHANGE: Additional documentation was added to Section 4.9 of the plan text detailing the representative wind sector chosen to set the background concentration for the area. In addition, a cursory evaluation of the Mott Street monitor as a representative background site was performed to further support the reasonableness of the background concentration used in the modeling analysis. Please see Attachment #1 for the evaluation of the Mott Street monitor. This additional analysis further justifies the reasonableness of the background concentration of 9 ppb for the entire area; the background concentration of 9 ppb relied on in the plan's modeling evaluation was not changed.

COMMENT #17: Referencing the Ameren consent agreement, EPA recommended that any performance analysis follow EPA procedures and noted that the use of beta options or other non-default options must be approved by the EPA regional office for use in regulatory applications.

RESPONSE: The Air Program acknowledges that EPA must approve the use of beta options or other non-default modeling options, as well as any performance analysis. The consent agreement provisions allow for the expeditious evaluation of such analyses and consideration of non-default options. The department will not allow non-default modeling options to be used for regulatory purposes without EPA oversight and approval of such activities. No changes were made to the plan as a result of this comment.

COMMENT #18: EPA recommended that the limits for the Ameren facilities in the consent agreement be on a unit-by-unit basis or grouped by like stacks assuming those stacks have the same potential impacts. As an alternative, MDNR should demonstrate that potential unit-by-unit

variability of emissions that could occur under the facility-wide limits would still be protective of the SO_2 NAAQS in the nonattainment area.

RESPONSE: The modeling demonstration yielded the 'critical values' for each unit that allows for the area to model compliance. These values are the hourly emission rates. Hourly recorded emissions were used to perform the variability analysis for each individual unit separately. This analysis follows the EPA 1-hour SO_2 nonattainment area SIP guidance for setting longer term averaging limits. Once the longer averaging time limit was found for each unit, they were summed to yield a facility total; this does not affect the stringency of the limits but rather seeks to decrease complexity of determining compliance with the limits. No changes were made to the plan as a result of this comment.

COMMENT #19: EPA commented that MDNR should model plants outside the nonattainment area at their respective allowable emission rates or provide sufficient justification that these sources are not modeling a significant concentration gradient in the nonattainment area.

RESPONSE: In conjunction with the Air Program's response to Comment #14, the background concentration for the NAA was re-evaluated using the Mott Street monitor values after the closure of the primary lead smelter. Based on this analysis, it was determined that the impact of Missouri sources inside and outside the nonattainment area are being captured in the background concentration. Sources not included in the background must be explicitly modeled. Therefore, the inclusion of these sources in the modeling inventory at their allowable emission rate is overly conservative. No changes to the plan were made as a result of this comment.

COMMENT #20: EPA commented that the 2018 emissions summary in Appendix C is incorrect. EPA stated that the draft plan suggests actual SO_2 emissions are expected to be reduced by over 20,000 tons per year; however, the only "enforceable" controls proposed for the Rush Island plant, which by the terms of the consent agreement would allow the plant to increase their actual emissions up to 50,633 tons per year at an 85% capacity factor.

RESPONSE: For the attainment year of 2018, the emissions inventory was taken from the 2018 emissions modeling platform developed by EPA. The point source emissions inventory was modified to include the actual reductions of emissions from the Doe Run smelter, which was a decrease from 2011 reported emissions of 20,000 tons per year. Based on allowable emissions at the Rush Island plant, the 2018 emissions inventory would be higher. Allowable emissions are based on the emission rate of a source calculated using its maximum rated capacity, subject to enforceable permit conditions or other enforceable limits and any applicable federally enforceable emission standards. However, the 2018 emissions inventory included in this SIP reflect what the expected actual emissions will be in the attainment year of 2018. As noted in EPA's comment, the average high 3-in-10 year actual occurs in 2008-2010 with 27,996 tons of actual emissions per year, which is considerably lower than the 50,633 tons of allowable emissions per year noted by EPA. Furthermore, based on the trend of emissions in recent years, Rush Island's actual emissions have been decreasing as illustrated in the chart below. Although the trend is not expected to keep decreasing at the same rate as recent years, it is also not expected to increase at a rate indicated by EPA.

Ameren Rush Island Energy Center SO_2 Emissions Trend	
Emission Year	SO_2 Emissions (tons per year)
2014	17,444.4
2013	19,587.1
2012	20,423.6
2011	28,035.6
2010	29,069.5
2009	28,327.3
2008	29,593.0
2007	22,058.5
2006	28,673.1
2005	28,384.8

In addition, based on modeling results of actual conditions, the Rush Island plant is in compliance with the standard. Additional monitors being installed near the plant will ensure the standard is being attained. Therefore, the use of actual emissions in the 2018 inventory is appropriate. No changes were made to the plan as a result of this comment.

COMMENT #21: Ameren Missouri supports the proposed revisions to the Missouri State Implementation Plan for the Jefferson County SO_2 nonattainment area. Ameren has entered into an agreement to lower SO_2 emission limits at the Rush Island, Labadie and Meramec Energy Centers and install and operate an SO_2 monitoring network around the Rush Island Energy Center. Unless a good quality data set with representative SO_2 measurements and meteorological information is available, air quality modeling simulations are generally inaccurate and produce higher values than actual monitored SO_2 levels. Based on geographical and meteorological qualities unique to the Jefferson County nonattainment area, and taking into consideration the localized impact inherent to SO_2 emissions, the use of air quality monitoring will most accurately measure the ambient concentrations of SO_2 in the NAA. Any future emission limitations should be based on solid defensible characterizations.

RESPONSE: The Air Program appreciates Ameren's comment in support of the SIP revision for the Jefferson County SO_2 nonattainment area. No changes to the plan were made as a result of this comment.

COMMENT #22: Ameren Missouri commented that reliance on both monitored and modeled emissions to develop an attainment plan is permitted under the CAA and EPA guidance. The CAA affords states with the authority and responsibility to implement SIPs to demonstrate attainment of a NAAQS. Notwithstanding the states' primary role in developing SIPs, EPA guidance instructs states to consider both modeled and monitored emissions to determine attainment of a NAAQS and develop attainment plans. EPA has a long-standing policy of allowing the use of actual emissions to demonstrate attainment of NAAQS.

RESPONSE: As discussed in the response to comment #1, EPA's 1-hour SO_2 nonattainment SIP guidance is non-binding and allows for states to develop other approaches due to unique local considerations. No changes were made as a result of this comment.

COMMENT #23: Ameren Missouri commented that the proposed SIP for the Jefferson County nonattainment area is the right approach for the state of Missouri. The SIP properly relies on monitored ambient air quality levels to determine air quality in Jefferson County. MDNR should continue to rely on monitored SO_2 ambient air quality as part of the SIP because Ameren has committed to installing a robust network of monitors. The use of monitoring is in the best interest of the state of Missouri since decisions as to whether to mandate emission reductions through costly control equipment installation should be made based on the best available data. This is particularly true when such equipment installation costs could reach over $1 billion and based on current data is not needed to meet the NAAQS. The use of actual emissions data in air quality modeling is supported by EPA and is most effective for the Jefferson County NAA.

RESPONSE: This comment outlines the rationale for the particular approach taken in the Jefferson County SIP. The SIP approach requires new SO_2 emission limits at Ameren's facilities, while adding ambient SO_2 monitors and meteorological stations at the Rush Island Energy Center in order to accurately characterize air quality. The department expects results from both existing and new SO_2 monitors to demonstrate attainment with the 1-hour SO_2 NAAQS, but if they do not, the consent agreement allows for adjustment to the SO_2 emission limits. No changes were made to the plan as a result of these comments.

COMMENT #24: AECOM identified several aspects of the Jefferson County SO_2 plan's modeling evaluation that would tend to overstate predicted SO_2 concentrations: 1) allowable emissions are used for some sources (e.g. 'intermittent sources'); 2) the modeling of merged stack flues as separate stacks; and 3) the modeling did not use more accurate low wind options.

RESPONSE: The AERMOD model is EPA's preferred model and was used in this demonstration. All sources in the modeling inventory, including 'intermittent sources' referenced in the comment, are represented using actual emissions. Since hourly emission rates were not available for these sources, static actual emission rates were used in the modeling analysis. However, allowable emissions were not used as a part of this analysis. Secondly, the emission units that share a stack were modeled as separate emission points with the same parameters. This situation was discussed with EPA Region 7 modeling staff early in the modeling analysis development, and the stacks were modeled separately to avoid using prohibited dispersion techniques in the modeling demonstration. In EPA's August 2010 guidance memorandum concerning implementation of the 1-hour SO_2 NAAQS for the Prevention of Significant Deterioration Program,[1] such dispersion techniques as combining gas streams, adjustments to source release parameters, etc., which could apply in this case, are only allowed under an exemption for sources whose plant-wide allowable SO_2 emissions do not exceed 5,000 tons per year (tpy). Neither facility that AECOM recommended should be modeled using these dispersion techniques qualify for this exemption, therefore, the units were modeled as separate release points. Lastly, the AERMOD beta options, such as accounting for low wind speed, were

[1] http://www.epa.gov/region07/air/nsr/nsrmemos/appwso2.pdf

not utilized because EPA approval is needed prior to the application of non-default modeling options in SIPs and obtaining that approval can be a timely process. No changes were made as a result of these comments.

Attachment #1

In response to comment #16 where EPA recommended the Air Program evaluate the Mott Street Monitor as the background monitor for the area, the following cursory analysis and evaluation were performed. The original background concentration analysis remains an element of the main plan text and submittal package. As shown below, the main scenario modeled impacts are low enough that both levels of background concentrations continue to demonstrate compliance with the NAAQS. Since the option of including an established background concentration directly in the AERMOD model run script was just recently added, background concentrations can be linearly added to the modeling output plotfile. The plotfile consists of the 4th high modeled concentration at each receptor that is then comparable to the NAAQS.

The Mott Street Monitor would have been a prime candidate to use as a representative background monitor for the area as it is centrally located within the area and is near the meteorological station where the data used in the modeling analysis was recorded. However, before the Herculaneum smelter shutdown, the Mott Street monitored values were overwhelmingly influenced by the smelter due to the close proximity and magnitude of emissions, particularly fugitive emissions. Therefore, the analysis performed here to evaluate Mott Street as a representative background monitor for the area is solely focused on the complete year of available data since the shutdown, 2014. Due to the lack of three full years of uninfluenced monitoring data, this analysis will not replace the background analysis contained in the plan, but instead acts as a cursory analysis in response to the EPA comment received.

The Mott Street meteorological data and monitoring concentrations were paired and evaluated. As all major sources located in the state of Illinois are already explicitly included in the model analysis, the wind directions originating from Illinois were removed from the background concentration evaluation. A map is included below to indicate the exact degree markers for the excluded sector. As shown, any measured concentrations on hours that originate between 25 and 135 degrees were removed. Sources that are now accounted for as part of the background concentration could be removed from the model analysis. However, to be conservative, sources within the NAA, close proximity sources, and the largest sources are still included in the model inventory.

Excluding winds that originate in Illinois, a representative background concentration was found. The 99th percentile of daily maximums of the remaining data yields a background concentration of 12.3 ppb. The analysis initially performed and included as part of the proposed SIP resulted in a background concentration of 9 ppb.

The modeled impacts for the main NAA Plan scenario are included below without any background concentration for ease of reference. Both background concentration levels continue to demonstrate compliance.

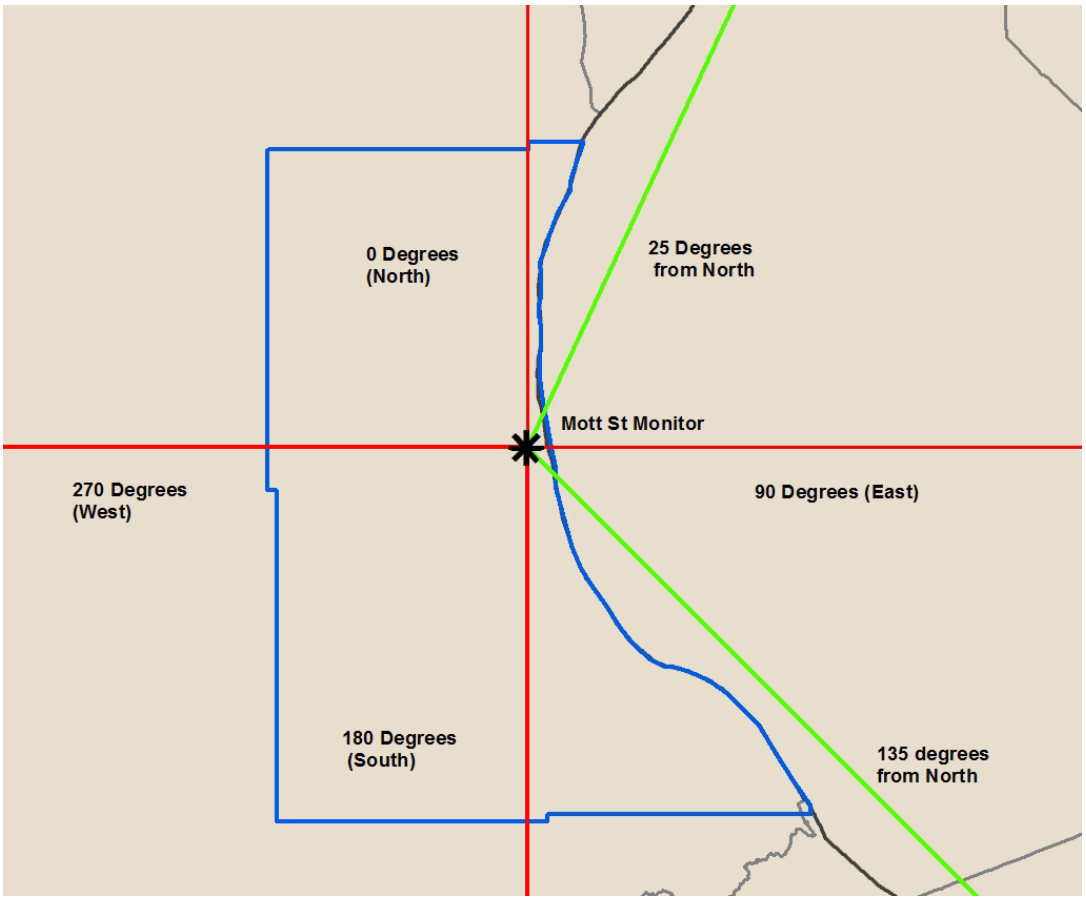
It should be noted that two episodes were removed from the analysis that were identified as originating in Illinois but outside the established excluded sector. Back trajectories for these episodes as well as the highest concentration days are included as part of this analysis. Trajectories for all days over 10 ppb were evaluated but not all the trajectories are included here.

Main NAA Plan Scenario:

Table 3 – Main NAA Plan Compliant Scenario Results by Subsector not including Background Concentration

Subsector	Highest Modeled Impact	
#	µg/m^3	ppb
1	164.04	62.54
2	157.93	60.21
3	89.44	34.10
4	142.37	54.28

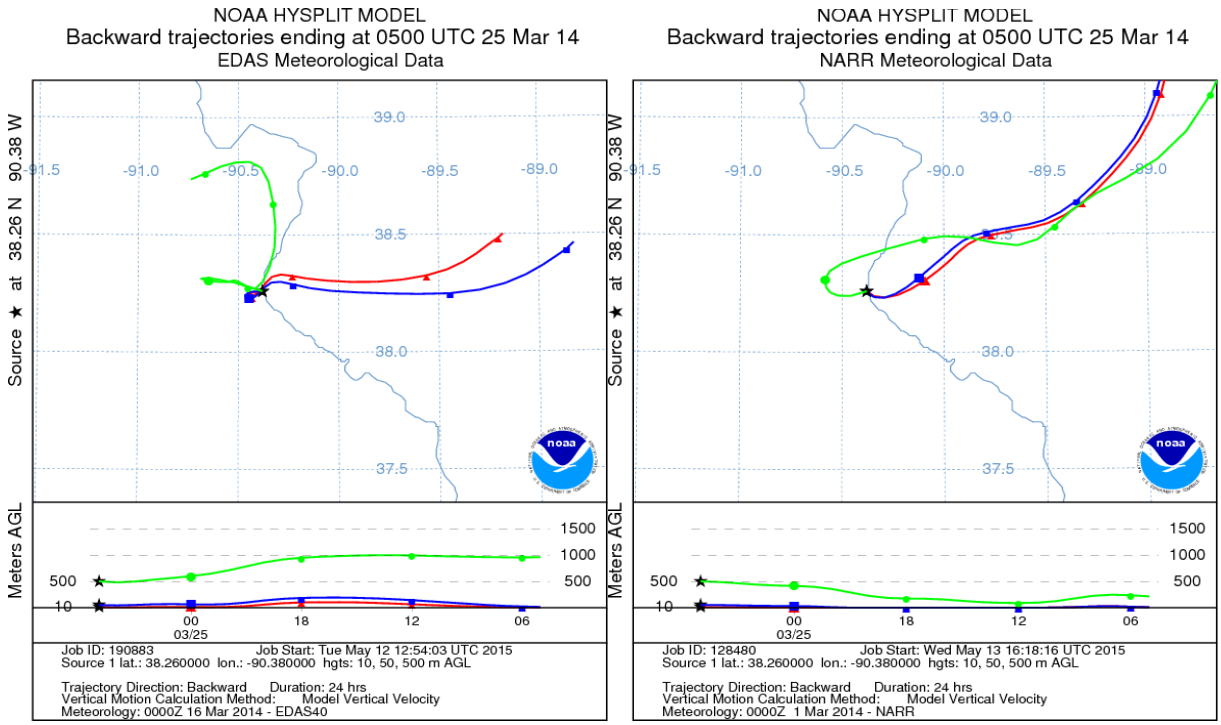
Figure 1: Map of wind sector degrees at the Mott St Monitor with excluded Illinois Sector (25-135 degrees)

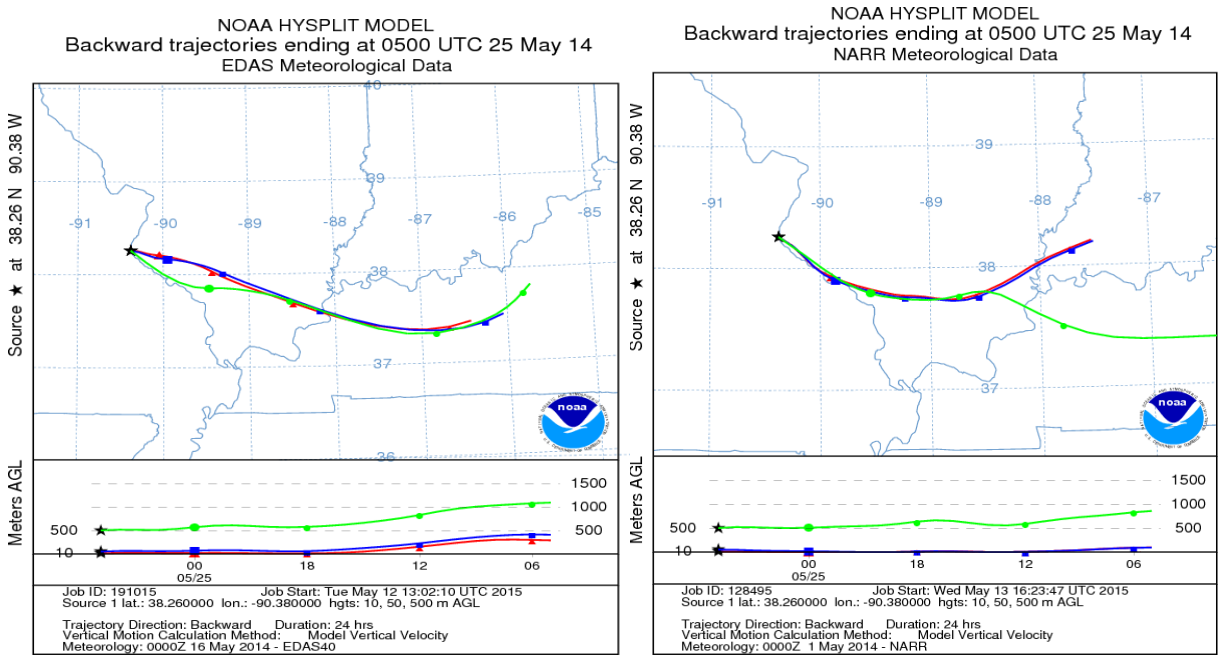


Back Trajectories:
The Air Program ran 24 hour back trajectory analyses using two sets of meteorological data (EDAS 40km and NARR 32km) for two days (March 24th and May 24th, 2014) showing concentration readings of 14.3 ppb and 13.3 ppb, respectively, in order to demonstrate who is contributing to the readings. Table 1 depicts that the majority of higher monitored values originated in the excluded sector, from Illinois. This is based on onsite meteorological data and the attached back trajectory figures included in Attachment A of this document. The Air Program used three trajectory heights of 500m (green), 50m (blue), and 10m (red) above ground level (AGL). The 500m level is less indicative of surface flows but more overall atmospheric movement. The 10m and 50m levels are more significant for ground level monitoring analysis such as this. The analysis showed that on the two mentioned episode days, the 10m and 50m trajectories originated in Illinois as shown in the figures. Therefore, these two episodes were also excluded from the background concentration evaluation for the year 2014.

Table 1: Exclusion Analysis Using Onsite Meteorological Data

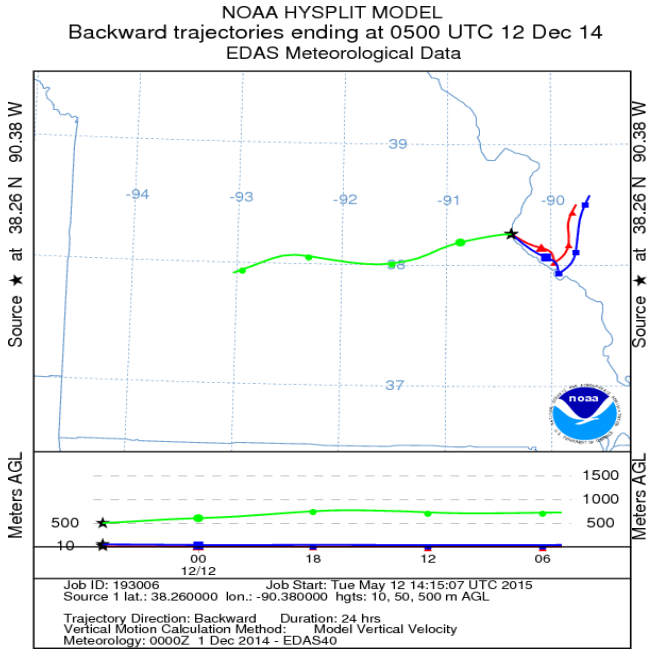
Date	Start Time	Sample Value (ppb)	Exclusion (y/n)
12/11/2014	9:00	23.3	y
3/6/2014	12:00	21.7	y
8/1/2014	12:00	21.7	y
3/6/2014	11:00	21.3	y
2/24/2014	13:00	18.2	y
2/3/2014	11:00	18.1	y
12/11/2014	10:00	17.7	y
5/22/2014	17:00	17.4	n
10/26/2014	11:00	17.1	y
2/28/2014	9:00	16.8	y
2/7/2014	16:00	15.8	y
5/22/2014	16:00	15.6	n
5/22/2014	9:00	15.5	n
11/7/2014	12:00	15.1	y
3/18/2014	13:00	14.3	y
3/24/2014	15:00	14.3	n
10/26/2014	12:00	14	y
3/5/2014	20:00	13.6	y
5/24/2014	11:00	13.3	n
3/5/2014	13:00	13.2	y
12/21/2014	20:00	13.2	y
3/24/2014	16:00	12.5	n

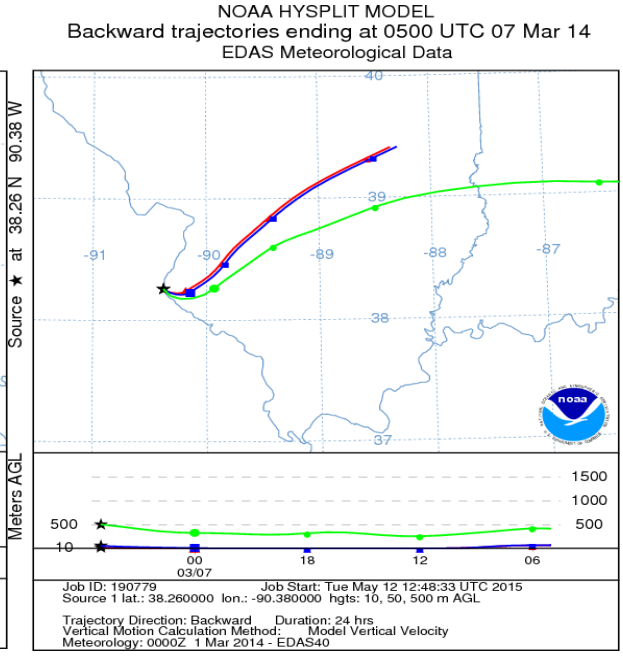


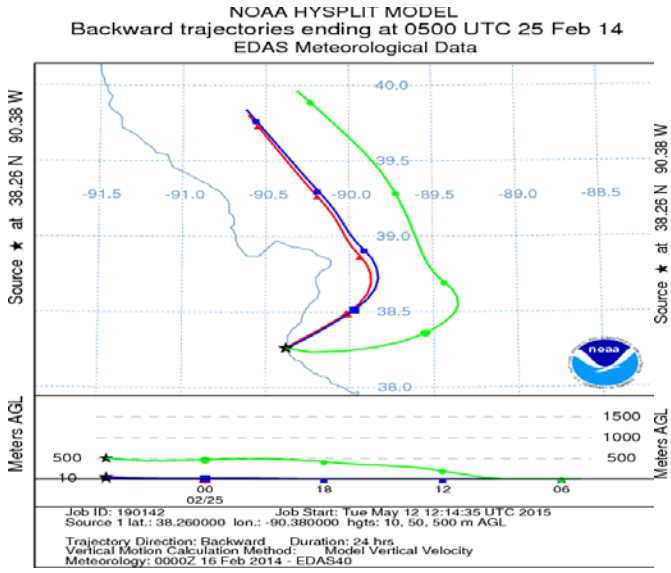


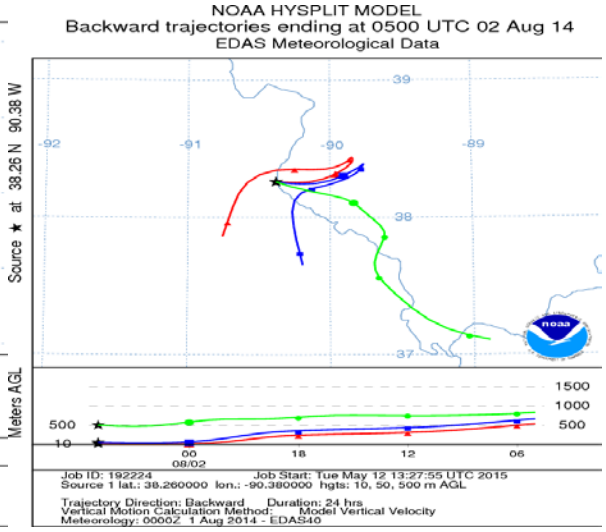
Note: The time zone in the figures is in Coordinated Universal Time (UTC). The time of 0500 UTC 25 May corresponds to the end of the day of May 24, 2014.

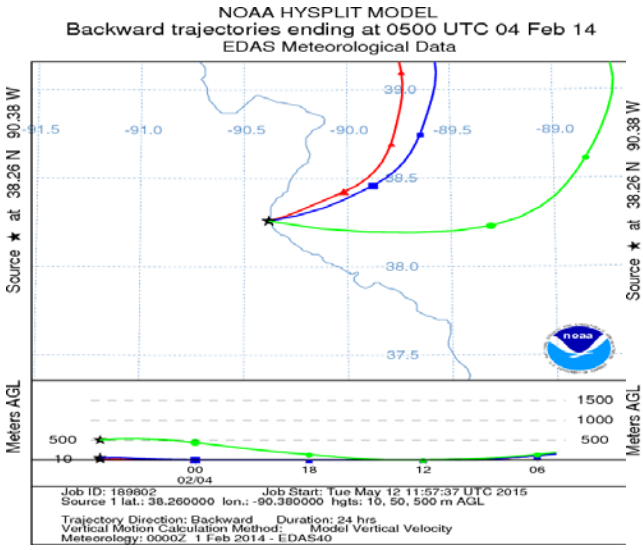
Attachment A

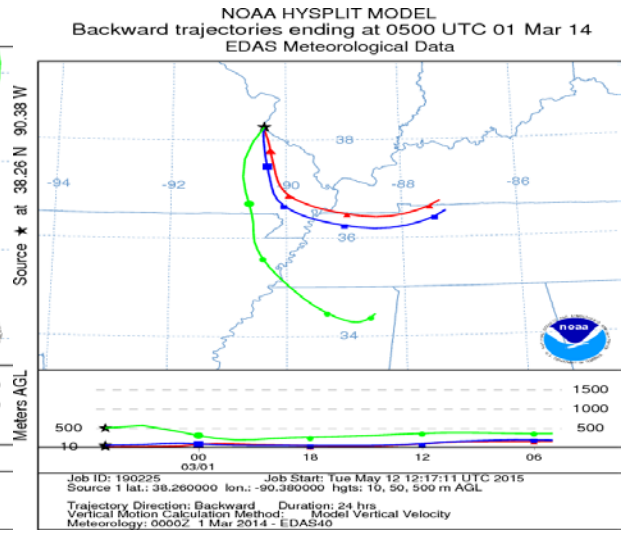


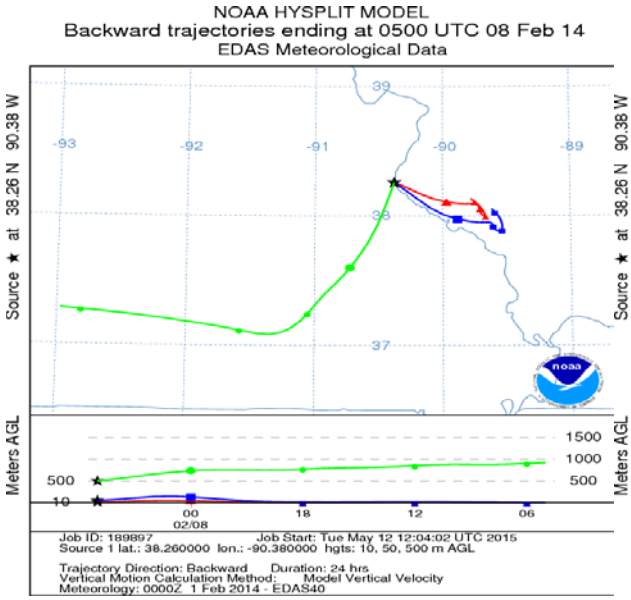


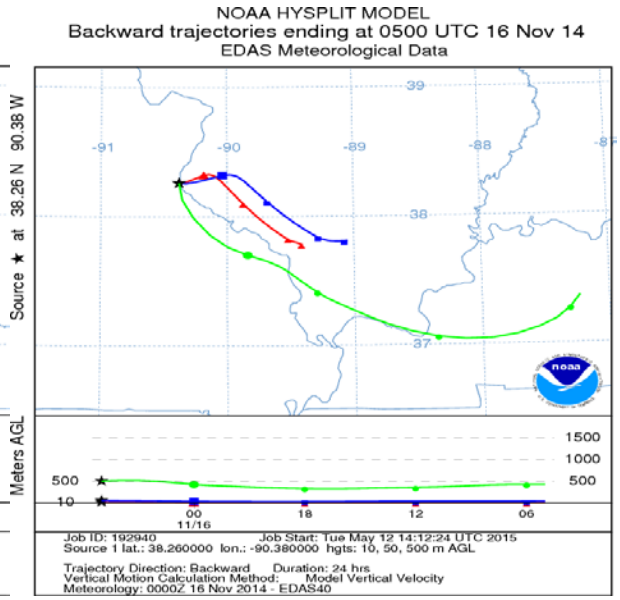


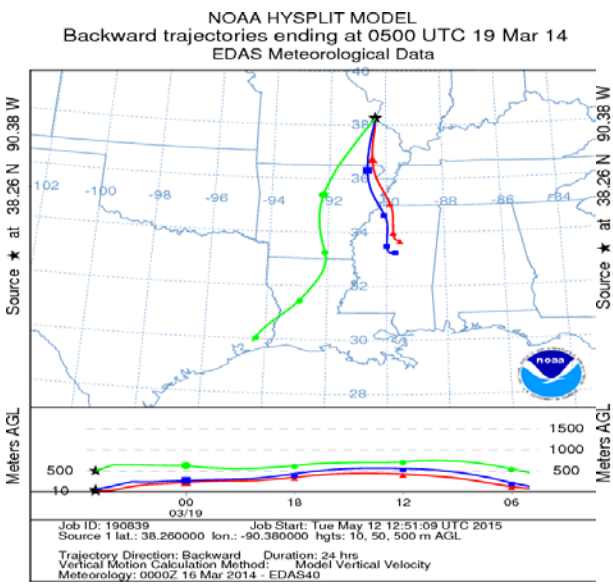



NOAA HYSPLIT MODEL
Backward trajectories ending at 0500 UTC 04 Feb 14
EDAS Meteorological Data
Source ★ at 38.26 N 90.38 W
Meters AGL
Job ID: 189802 Job Start: Tue May 12 11:57:37 UTC 2015
Source 1 lat.: 38.260000 lon.: -90.380000 hgts: 10, 50, 500 m AGL
Trajectory Direction: Backward Duration: 24 hrs
Vertical Motion Calculation Method: Model Vertical Velocity
Meteorology: 0000Z 1 Feb 2014 - EDAS40


NOAA HYSPLIT MODEL
Backward trajectories ending at 0500 UTC 01 Mar 14
EDAS Meteorological Data
Source ★ at 38.26 N 90.38 W
Meters AGL
Job ID: 190225 Job Start: Tue May 12 12:17:11 UTC 2015
Source 1 lat.: 38.260000 lon.: -90.380000 hgts: 10, 50, 500 m AGL
Trajectory Direction: Backward Duration: 24 hrs
Vertical Motion Calculation Method: Model Vertical Velocity
Meteorology: 0000Z 1 Mar 2014 - EDAS40


NOAA HYSPLIT MODEL
Backward trajectories ending at 0500 UTC 08 Feb 14
EDAS Meteorological Data
Source ★ at 38.26 N 90.38 W
Meters AGL
Job ID: 189897 Job Start: Tue May 12 12:04:02 UTC 2015
Source 1 lat.: 38.260000 lon.: -90.380000 hgts: 10, 50, 500 m AGL
Trajectory Direction: Backward Duration: 24 hrs
Vertical Motion Calculation Method: Model Vertical Velocity
Meteorology: 0000Z 1 Feb 2014 - EDAS40


NOAA HYSPLIT MODEL
Backward trajectories ending at 0500 UTC 16 Nov 14
EDAS Meteorological Data
Source ★ at 38.26 N 90.38 W
Meters AGL
Job ID: 192940 Job Start: Tue May 12 14:12:24 UTC 2015
Source 1 lat.: 38.260000 lon.: -90.380000 hgts: 10, 50, 500 m AGL
Trajectory Direction: Backward Duration: 24 hrs
Vertical Motion Calculation Method: Model Vertical Velocity
Meteorology: 0000Z 16 Nov 2014 - EDAS40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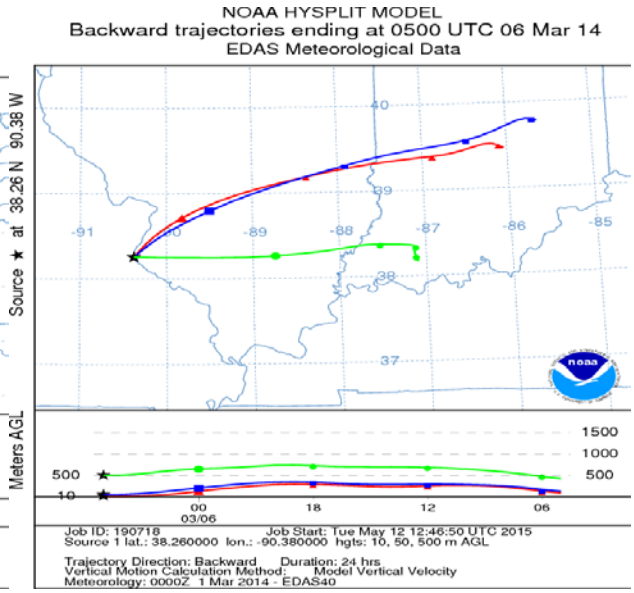
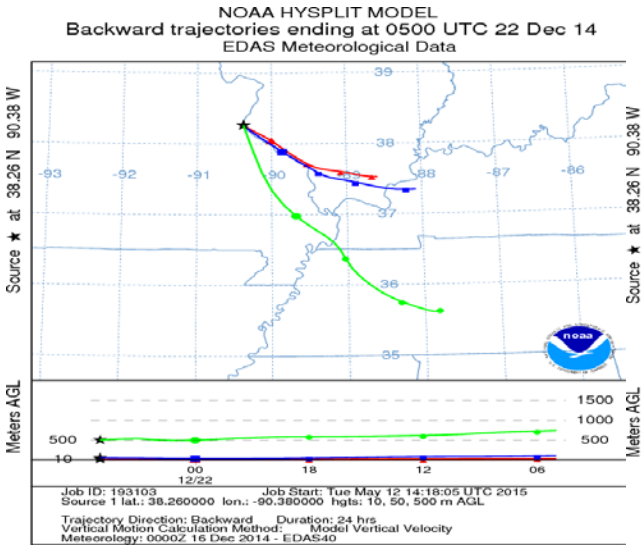
Backward trajectories ending at 0500 UTC 19 Mar 14
EDAS Meteorological Data
Source ★ at 38.26 N 90.38 W
Meters AGL
Job ID: 190839 Job Start: Tue May 12 12:51:09 UTC 2015
Source 1 lat.: 38.260000 lon.: -90.380000 hgts: 10, 50, 500 m AGL
Trajectory Direction: Backward Duration: 24 hrs
Vertical Motion Calculation Method: Model Vertical Velocity
Meteorology: 0000Z 16 Mar 2014 - EDAS40


NOAA HYSPLIT MODEL
Backward trajectories ending at 0500 UTC 06 Mar 14
EDAS Meteorological Data
Source ★ at 38.26 N 90.38 W
Meters AGL
Job ID: 190718 Job Start: Tue May 12 12:46:50 UTC 2015
Source 1 lat.: 38.260000 lon.: -90.380000 hgts: 10, 50, 500 m AGL
Trajectory Direction: Backward Duration: 24 hrs
Vertical Motion Calculation Method: Model Vertical Velocity
Meteorology: 0000Z 1 Mar 2014 - EDAS40


NOAA HYSPLIT MODEL
Backward trajectories ending at 0500 UTC 22 Dec 14
EDAS Meteorological Data
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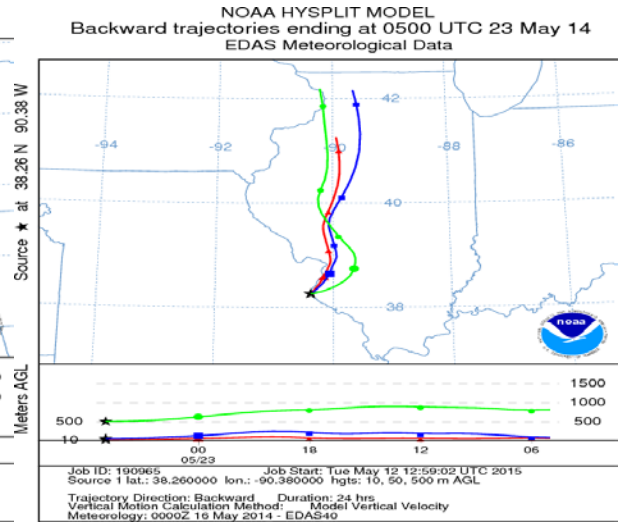
Meters AGL
Job ID: 193103 Job Start: Tue May 12 14:18:05 UTC 2015
Source 1 lat.: 38.260000 lon.: -90.380000 hgts: 10, 50, 500 m AGL
Trajectory Direction: Backward Duration: 24 hrs
Vertical Motion Calculation Method: Model Vertical Velocity
Meteorology: 0000Z 16 Dec 2014 - EDAS40


NOAA HYSPLIT MODEL
Backward trajectories ending at 0500 UTC 23 May 14
EDAS Meteorological Data
Source ★ at 38.26 N 90.38 W
Meters AGL
Job ID: 190965 Job Start: Tue May 12 12:59:02 UTC 2015
Source 1 lat.: 38.260000 lon.: -90.380000 hgts: 10, 50, 500 m AGL
Trajectory Direction: Backward Duration: 24 hrs
Vertical Motion Calculation Method: Model Vertical Velocity
Meteorology: 0000Z 16 May 2014 - EDAS40