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THE ADMINISTRATOR OF THE ENVIRONMENTAL PROTECTION AGENCY

WASHINGTON, D.C. 20460

DEC 14 2012

Mr. Zak Covar
Executive Director
Texas Commission on Environmental Quality
P.O. Box 13087
Austin, Texas 78711-3087

Dear Mr. Covar:

I am pleased to respond to your July 18, 2012, letter in which you filed a petition for reconsideration on behalf of the Texas Commission on Environmental Quality concerning the U.S. Environmental Protection Agency's final rule, "Air Quality Designations for the 2008 Ozone National Ambient Air Quality Standards." *See 77 Federal Register 30008 (May 21, 2012)*. The petition requests that the EPA reconsider the nonattainment designation for Wise County, Texas, as part of the Dallas-Fort Worth ozone nonattainment area and also requests that the EPA stay the effective date of the designation for Wise County, pending reconsideration.

The EPA has carefully evaluated the issues and information in your petition. For the reasons provided in the enclosure to this letter, the EPA is denying your petition and request for stay. The EPA continues to believe that Wise County is properly designated nonattainment because of its contribution to ozone nonattainment in the Dallas-Fort Worth area.

The enclosure addresses the specific issues in your petition and provides the basis for this denial. The EPA hopes that the responses will help to explain the agency's conclusions so that you will better understand our final decision. The EPA considers the designation of nonattainment areas with appropriate boundaries to be an important step in implementing the 2008 ozone standards.

Please know that we look forward to working with the state of Texas and those in the Dallas-Fort Worth area to ensure achievement of the 2008 ozone standards.

In the meantime, I thank you for your interest in protecting the quality of our environment.

Sincerely,

A handwritten signature in black ink, appearing to read "Lisa P. Jackson".

Lisa P. Jackson

Enclosure

Enclosure

EPA Response to Petition for Reconsideration from the Texas Commission on Environmental Quality

By letter dated July 18, 2012, the Texas Commission on Environmental Quality (TCEQ) petitioned the EPA to reconsider the final area designation for Wise County in the Dallas-Fort Worth (DFW) area. For the reasons discussed below, the EPA is denying the Petition. TCEQ also requested that the EPA stay the effective date of the designation for Wise County. Because the EPA is denying Petitioner's reconsideration request, the EPA is also denying the stay request. For the sake of clarity, we have organized this response according to the structure of the July 18, 2012 Petition.

I. Analysis of TCEQ's Source Apportionment Modeling:

Issue: The EPA erred in failing to follow its own guidance. The guidance requires the agency to use the Source Apportionment Modeling (SAM) results in a relative way using a relative response factor (RRF) and anchor the analysis on the base year Design Value (DV) at the monitor, rather than using modeled future-year concentrations directly in a deterministic approach (using direct model outputs). The EPA ignored the TCEQ SAM relative response-based predictions and instead cherry-picked direct predictions from TCEQ's SAM (not anchored to any measurements) to declare that Wise County's contribution to the Eagle Mountain Lake monitor's design value was significant. The same principles apply where ozone concentrations at a monitor location are allocated to a specified set of emission sources, an approach the EPA followed in the modeling conducted for the Cross State Air Pollution Rule (CSAPR).

Response: The EPA fully described the reasons it weighed some of the model outputs provided by Texas more than others and why we evaluated Texas's SAM results using additional metrics. Thus, we do not believe this issue warrants reconsideration. We note that in Texas's February 29, 2012 comment letter attachment they included SAM results using the absolute values from the model (average and maximum contributions) and also results using an RRF technique. So the EPA did not cherry pick the results but used information provided by Texas and further evaluated Texas's SAM results.¹ In fact, TCEQ had six different figures with the absolute values and only one figure with relative values for the DFW SAM comments.

As discussed in greater detail in the Technical Support Document (TSD) and in other Responses in this Petition response, we had concerns with model performance and that the episode was not reflective of the complete suite of conditions that result in ozone exceedances in the DFW area. Because of our concerns we indicated that we were putting more weight on the day specific (absolute values) and not the average values. The RRF approach averages the impacts over all exceedances, and with a limited set of modeled days we believe this could give a potentially misleading assessment. Even in an analysis of the entire ozone season, we would still want to evaluate the day-specific impacts in addition to the averaged and relative impacts to determine if impacts occur often enough from a specific meteorological regime that transports emissions from an area that is not transported toward the monitor in other regimes, which would potentially limit an area's ability to reach attainment.² For example if a regime occurs on average only 20% of the time but drives the overall area's design value (DV), it could have

¹ See Enclosure to Texas's February 29, 2012 comment letter. Absolute values SAM analysis included Pages 10-14, Figures 7, 8, 9, 10, 11, 12 for the DFW area and Pages 18-27, Figures 17-32 for the Houston/Galveston/Brazoria area.

² In the case of Wise County and DFW we discuss in the TSD and elsewhere that the meteorological regime of Light and Variable winds with some recirculation of air masses is one of the classic worst-case regimes that often impacts the DFW design value.

significant implications for attainment. Because the RRF approach averages the impacts of all the meteorological regimes, it masks to some degree the impact of the meteorological regime that drives the highest levels. This is of particular concern in evaluating SAM for a determination of inclusion/exclusion of a county under only one meteorological regime. Note that if the EPA had used a relative reduction factor approach to estimate the day-specific impacts from the TCEQ SAM, we believe the modeled impacts from Wise County would likely have been larger.³

SAM is a technique to look at culpability of individual areas or source groups on specific area(s) of concern, and it is common to use both direct model results and relative modeling results. The EPA's SAM analysis is consistent with many past SAM analyses that have been conducted by the EPA, RPOs, states, and other researchers. The EPA has never issued specific guidance on how SAM analysis should be performed, therefore our analysis does not conflict with the EPA guidance. The EPA has issued guidance for attainment demonstrations indicating that modeling should be analyzed in a relative sense using the RRF technique for determining whether the emissions reduction measures in an adopted plan will achieve overall attainment/nonattainment, but the EPA has not issued guidance on how SAM should be evaluated or more specifically how SAM should be performed when evaluating the impact of a county on a violating monitor in the context of an attainment/nonattainment designation decision. We further note that to the extent that the EPA has guidance on modeling, guidance documents are not binding rules and thus cannot "require" any specific action by the EPA, states or any other party. As noted, the EPA fully explained how it interpreted the SAM results in the record for this action.

The EPA has used SAM to support national rulemakings such as the CSAPR to assess a state's impact on downwind receptors of concern (the EPA defined nonattainment or maintenance receptors). In the context of this designation action, TCEQ submitted and the EPA used SAM to evaluate impacts of a single county's emissions contribution to a downwind receptor in an adjacent nonattainment area. This is fundamentally a finer scoping of SAM compared to analyses in the EPA's national rulemakings that are on the scale of state-to-state impacts, so there is no direct comparison. As discussed further in addressing other specific issues raised in the petition, we think there were concerns and differences that we documented in our Final TSD that supported our consideration of impacts on a daily basis, and we therefore focused on the higher and maximum impacts than on the average impacts that would result from a RRF based analysis.⁴ We note, however, that contrary to the suggestion by the Petitioner, when we have used SAM in national rulemakings the EPA has used absolute values as well as relative values.

Issue: TCEQ's RRF analysis results for Wise County indicated the impact from Wise County emissions at the Eagle Mountain Lake monitor was 0.41 parts per billion (ppb). This value is below the EPA's 1% threshold, therefore Wise County should not have been included in the DFW nonattainment area.

Response: As also discussed elsewhere, the EPA does not have specific guidance on evaluating SAM results nor how to evaluate the impact of emissions from a county on a nearby violating monitor in the context of a designation decision. The EPA evaluates each submission of SAM on a case-by-case basis, carefully assessing a number of issues including how the modeling was conducted, model performance, and available data from the analysis in order to derive appropriate conclusions from the results. The EPA used a 1% of the National Ambient Air Quality Standards (NAAQS) (0.75 ppb) cutpoint in evaluating SAM results to identify days with a non-trivial impact. We did not imply that 1% of the NAAQS was a criteria threshold point for inclusion or exclusion. Our basis for identifying days with a

³ Electronic SAM files provided by TCEQ included a file "Hood-Wise_Dvf_Contribution_wPies.xls" that included both the absolute values and the RRF based calculated value. The absolute 2012 impacts from Wise County on the Eagle Mountain Lake monitor is 0.58 ppb (mean of 10 days used in the RRF) and the RRF based approach has a value of 0.64 ppb.

⁴ Final TSD SAM discussion on pages 15-20 and HYSPLIT discussion pages 14-15.

non-trivial impact is discussed on page 17 of the TSD where we explained, “[o]ften in attainment demonstration modeling, controlling of sources is evaluated and results in only a few tenths of a ppb change, therefore we used a 1% of the standard threshold for the days where we would consider Hood or Wise County’s emissions to be significant.” We also note that modeling from TCEQ in a 2007 8-hour Ozone Attainment Demonstration for DFW included multiple analyses of individual control strategies and the resultant impacts on monitors in DFW area, where Texas had chosen controls that provided changes of a few tenths of a ppb. In addition, we considered the recent Cross State Air Pollution Rule, which used a one percent threshold in the source apportionment modeling to determine if a state’s emissions significantly impacted a downwind state’s nonattainment or maintenance area. Thus we determined that an impact of 0.75 ppb, or one percent of the 2008 ozone standard, which is higher than that used by the state in determining emissions strategies for the DFW area, would be appropriate as a metric to identify days with a nontrivial impact.

It is important to note that the number of days with an impact of 0.75 ppb or more is only one of the metrics evaluated from the SAM results. In the DFW Final TSD and in supporting files, we discussed all of the metrics used in our assessment of the SAM results, and the unique factors that we weighed in our analysis of SAM results for DFW. Given the detailed daily information available for analyzing SAM for the DFW and Houston areas designations, we evaluated the average impact, maximum impact, and an additional metric, the number of days where impacts may be high enough that reductions might be beneficial in development of an attainment demonstration.

Issue: The EPA appears to conclude in the Final TSD that TCEQ’s SAM was not adequate because it was not inclusive of an entire ozone season in addition to underestimating exceedances on many days by underpredicting peak values. To compensate for these concerns, the EPA relied on absolute modeled maximum concentrations to predict the potential contribution from Wise County to the DFW nonattainment area. The use of photochemical modeling that supports a DFW attainment demonstration is appropriate and relevant evidence to determining the potential downwind contribution of Wise County to the DFW nonattainment area; it is the best evidence possible. It was irrational for the EPA to fail to utilize this evidence, particularly since the EPA had ample opportunity to notify TCEQ of any concerns. The EPA’s rationale for not utilizing the TCEQ SAM because it did not include an entire ozone season is based on the fact that the TCEQ SAM should have included days from the August-September period, which typically show higher ozone concentrations than the June period modeled. This reason ignores the specific facts of the actual monitoring data for 2006, which the EPA does not explain. The EPA also ignored the basis and support provided for the June 2006 episode days, instead of an entire ozone season.

TCEQ referred to the Modeling Protocol for the 2011 DFW Ozone Attainment Demonstration, provided to the EPA on October 5, 2010, noted that the 2006 base year was chosen largely because it represents an exceptionally rich set of air quality and meteorological measurements, which satisfies one of the criteria listed in the modeling guidance for selecting episodes. The protocol also explained that in 2006, June had the most high- ozone days of any month (more than August/September), and that all the meteorological conditions linked to formation of high ozone concentrations were represented, also consistent with the guidance. TCEQ continued that the EPA modeling guidance recommends relatively long time periods covering multiple synoptic cycles and does not require a full ozone season, so using the May 31 - July 2, 2006 period is entirely consistent with the guidance.

The EPA’s explanation does not address why an episode based on an entire ozone season would be necessary, given that the more specific period of May 31 - July 2, 2006 had the most high-ozone days of any month in 2006. The EPA’s evaluation of the TCEQ SAM ignored both the factual monitoring data

for 2006 and its own guidance to use modeling in a relative sense, without explaining why this deviation from established guidance was appropriate in this case.

Response: The EPA did consider the SAM results provided by TCEQ and our concerns with the SAM are documented on pages 15-20 of our Final TSD.⁵ The EPA took these concerns into account in our interpretation of the SAM results for purposes of designations. The EPA recognizes that model episode selection is always a balance of many factors including the availability of data and the time available for completion in addition to considerations as to whether all important meteorological regimes have been addressed. We would agree that the 2006 episode is a great improvement over the previous 10-day episode for Dallas from 1999. Because these factors have to be balanced, no model episode is perfect and the limitations have to be considered. In this case the modeling does not include all of the meteorological regimes that can lead to high ozone and the model has an under prediction bias. We also noted that TCEQ's own DFW conceptual model analyses, that has been included in TCEQ's 2011 DFW Ozone Attainment Demonstration SIP and past Attainment Demonstrations SIPs, also indicated a roughly bimodal distribution of ozone exceedances with highest values in mid- to late-summer (July-September), and that this latter summer period had some different meteorological regimes than the early summer period that TCEQ included in their modeling. Based on our analysis of HYSPLIT results, the worst days for some of the DFW area monitors that set the Design Value are in the later summer. Later summer is also when the frequency of weak frontal passages are higher where we could see influence from Wise County emissions on DFW nonattainment monitors more often. The fact that not all meteorological regimes are addressed led us to weigh day-specific impacts and maximum impacts more than average impacts. It is important to note that since violations of the ozone NAAQS cannot be separated from exceedances,⁶ looking at day specific impacts would be reasonable even if the model covered a full ozone season. The fact that the model has an under-prediction bias led us to consider that the model was not predicting all of the exceedances that had occurred during the episode. We note that the current 2011 DFW Ozone Attainment Demonstration modeling of 2012 projected levels indicated that the DFW area would be well under the 1997 8-hour standard, but based on 2008-10 data at the time and more recent 2011 (DV of 90 ppb) and 2012 preliminary data (DV of 87 ppb), the area is still well above the levels projected by the model (2012 DV of 78 ppb). This confirmed our concerns about modeling underprediction bias.

⁵ EPA Final TSD pp. 15-20 and including this quote on pp. 16, “[e]valuations of the conceptual model for high ozone in DFW by TCEQ, EPA and others indicates that high ozone in DFW is roughly a bimodal distribution with lower peaks in early summer (May-June) and the highest values in mid to late-summer (July-September) and that the mid to late summer has some different meteorological/transport regimes than the early summer episodes. Therefore, TCEQ’s SAM does not include a large number of days and does not include all of the meteorology regimes conducive for ozone events in DFW and is missing the events that happen in mid to late-summer that often set the DFW area’s DV.”

⁶ In analyzing possible contributions from emissions in surrounding counties using the SAM tool, the EPA only evaluated and considered the amount of modeled impact from Wise County emissions on monitors that were violating the 2008 ozone standard according to the 2008-2010 data. We focused our assessment on monitors violating the standard and, in doing so, examined contributions on days when there were exceedances at those violating monitors. As a factual matter, it is not possible to separate “actual violations” from the “exceedances” that result in the violation. Based on the form of the ozone standard, an area is determined to be violating the standard if the three consecutive year average of the annual fourth highest daily maximum 8-hour average ambient air quality ozone concentration is greater than the standard (0.075 ppm). Therefore, all daily maximum 8-hour averages that exceed 0.075 ppm at a violating monitor (i.e., “exceedances”) are relevant for purposes of determining whether emissions contribute to a violation at that monitor. Accordingly, we restricted our review of available modeling impact results to days with modeled exceedances at violating monitors. As part of this analysis, we evaluated the monitoring data during the episode modeled to determine if exceedances had actually occurred at the monitor on that specific day. The use of modeled exceedance days for estimating ozone using photochemical grid models is a long-established practice for modeled attainment demonstrations. This approach is recommended by the EPA in “Guidance on the Use of Models and Other Analyses for Demonstrating Attainment of Air Quality Goals for Ozone, PM_{2.5}, and Regional Haze” (EPA-454/B-07-002), and used by the EPA to support Federal rules such as the Cross-State Air Pollution Rule.

We also note that while weak frontal passages are one of the conceptual model meteorological regimes for the DFW area for the 1997 8-Hour standard and would also be expected to be one of the key regimes for the 2008 8-Hour Ozone standard, and there were not many of these in later summer 2006 compared to what occurred in other years. There were a number of these specific regimes in 2007 and other years, including one in August 2007 that resulted in the highest 8-hour readings monitored in DFW in the last 15 years (121 ppb at two monitors). The EPA's modeling guidance is premised upon trying to model the meteorology/emissions of past ozone exceedances such that a modeling system can be developed to accurately assess potential impacts of emission changes and predict if an area will reach attainment by the required date. Based upon the many competing factors, including the amount of time it takes to run computer models and develop modeling that is performing accurately enough for the task at hand the EPA's guidance is to weigh the mitigating factors and model enough days to develop a sufficient modeling system. The EPA's guidance does indicate that at a minimum, areas should model enough days to capture multiple synoptic periods and many areas have been modeling complete ozone seasons to help capture enough days and meteorology combinations that perform adequately for use in predicting future attainment/nonattainment levels.⁷

Issue: The EPA also justified its use of the absolute modeled maximum concentration because the TCEQ modeling under-predicted the peak 8-hour contributions in 2006. The RRF concept was developed precisely to correct for situations where the model over- or under-predicts the baseline concentrations. The EPA failed to explain why the RRF concept, developed by the EPA to address both the possibility of under- and over-prediction of photochemical models, was not applied for the purpose of evaluating the possible contribution of Wise County to the DFW nonattainment area.

The EPA appears to argue that the TCEQ SAM was not adequate because the TCEQ SAM used spatially averaged baseline and future ozone concentrations instead of maxima. However, since the EPA didn't actually use the RRF-based contribution to 2012 future design values, this argument is irrelevant. The primary reason the EPA guidance was developed supporting the use of the maximum value "near" a monitor is to allow the RRF calculation to account for possible migration of ozone plumes due to implementing controls in an area. Instead of considering an RRF-based approach, the EPA relied on the 2012 daily modeled absolute contributions.⁸

Similarly, there is no rational basis for the EPA's use of a 70 ppb threshold for selecting days to analyze since the EPA did not use those days to calculate an RRF as per the EPA guidance. Instead, the EPA selected days using a 70 ppb threshold from the 2006 baseline and used corresponding days in 2012 to look for Wise County contributions above 0.75 ppb. On many of those days in 2012, the predicted eight-hour ozone concentrations were less than 75 or 70 ppb. The EPA should have selected days using a 75 ppb threshold from the future year modeling, but in any event, did not provide a rational basis for its

⁷ The EPA's 2007 Modeling Guidance pp.122-23, "Due to increased computer speeds, it is now prudent to recommend modeling relatively long time periods. For 8-hour ozone and 24-hour PM2.5, **at a minimum**, (emphasis added) modeling episodes which cover full synoptic cycles is desirable. Depending on the area and the time of year, a synoptic cycle may be anywhere from 5-15 days. Modeling even longer time periods of up to a full season may simplify the episode selection process and provide a rich database with which to apply the modeled attainment test."; pp. 140 "With the advancement in computer technology over the past decade, computer speed and storage issues are no longer an impediment to modeling long time periods. In fact, many groups have recently modeled entire summers and/or full years for ozone, PM2.5, and regional haze (Baker, 2004a) (U.S. EPA, 2005b)"

⁸ The TCEQ used averages instead of maxima for its calculation of the future DV contributions because the APCA software reports averages, but notes that using averages does not necessarily introduce bias in the RRF calculation. In fact, the total DV calculated using the APCA average-based RRF only differed from that calculated using the maximum-based RRF by 0.2 ppb (77.86 ppb vs. 78.06 ppb), so it is extremely unlikely that using spatial maxima would have made any perceptible difference in Wise County's modeled 2012 DV contribution.

selection. For example, the EPA notes in the DFW TSD that "This analysis indicated Wise County emissions had even larger impacts of up to 5 ppb on the Eagle Mountain Lake monitor." The EPA refers to the 2012 contribution from Wise County to Eagle Mountain Lake of 5.03 ppb on June 13th. While in the 2006 baseline modeling the eight-hour ozone maximum concentration in the 3x3 grid cell array around the Eagle Mountain Lake monitor on June 13 was 72.91 ppb, in the 2012 modeling the eight-hour ozone maximum concentration in the 3x3 grid cell array around the Eagle Mountain Lake monitor was only 59.74 ppb. Although Wise County may have contributed 5.03 ppb to the 2012 modeled concentration of 59.74 ppb, the total 2012 predicted ozone was much less than the 2008 eight-hour ozone standard of 75 ppb. The EPA thus erred in their analysis by selecting days to analyze based on comparing the 2006 baseline ozone concentrations to a 70 or 75 ppb threshold. The comparison should have been made to 2012 future year ozone predicted concentrations. Furthermore, the EPA's choice to analyze days with ozone concentrations as low as 70 ppb, was erroneous, since such days could not reasonably be expected to contribute to nonattainment of the 2008 ozone NAAQS.

Response: TCEQ's comments included both the maximum and average impact values for Wise County emissions based on using the absolute SAM results for 2012 (not using the RRF technique). The RRF calculation approach for DFW was provided in one Table, in addition to the 6 figures presenting absolute results from direct model output data (without any RRF analysis). As noted above, the EPA placed less weight on the average impact, which includes both the average of the days, and the RRF approach which is another way to average the information over all the days above a threshold. The EPA explained our reasoning for considering modeled impact on days with values of less than 75 ppb. In the TSD (page 16) we indicated:

"Therefore, TCEQ's SAM does not include a large number of days and does not include all of the meteorology regimes conducive for ozone events in DFW and is missing the events that happen in mid to late-summer that often set the DFW area's DV. As a result, it may be appropriate to place more weight on the maximum estimated impact and the number of days with sizeable impacts on violating monitors as compared to average impact. Another observation is that the evaluation used modeled exceedances for contribution and the modeling is underestimating exceedances on many days and therefore is underestimating the number of days of potential contribution. Modeling is significantly under predicting peaks by 5-20 ppb at critical monitors; therefore we also looked at contribution at lower modeled values (70 ppb)."

We also noted that the RRF approach indicates that a threshold lower than the standard can be used and should be used if there are not enough days with modeling values above the standard in the base (2006 in this case). The EPA's attainment demonstration guidance for the 1997 8-hour standard recommended using thresholds as low as 15 ppb below the standard to obtain enough days for evaluation, especially when weighing that the base modeling is underestimating compared to the monitoring data. For the 1997 8-hour ozone standard (84 ppb), our guidance allows basecase (2006 here) modeling days as low as 70 ppb to be used for the RRF evaluation. This supports the use of modeled days with thresholds of 70 and 75 ppb in the basecase 2006 modeling instead of only evaluating days with modeled exceedances in 2012. Although we have not revised our guidance for the 2008 8-hour ozone standard, we can try applying the same logic to the 75 ppb standard, which could result in values as low as 59 ppb to be allowed in RRF calculations. We also note that TCEQ's own RRF analysis used days with values below 70 ppb and even below 60 ppb in the 2012 model projections and only had 3 days out of 10 with values above 75 ppb in the RRF calculations for the Eagle Mountain Lake monitor. The use of this lower threshold in the guidance is a direct result of taking into account potential issues with model underprediction, etc., so the logic to use a threshold of 65 or 70 ppb is within the logic and guidance currently used for RRF analyses in our guidance. Therefore we disagree with TCEQ assertion that we

have not validated using a modeling threshold of 70 ppb period, when their own RRF based comments included values as low as 58 ppb in 2012.

TCEQ's 2012 ozone modeling projections using the RRF technique indicate only four monitors in the DFW area would be above the 75 ppb standard, with the highest value of 78.06 ppb at the Eagle Mountain Lake monitor. In contrast, the actual 2009-2011 DV was 83 ppb and the preliminary 2010-2012 DV at Eagle Mountain Lake is 82 ppb. Furthermore, 80% of the monitors in DFW are exceeding the 75 ppb standard (16 of the 20 monitors) and have preliminary 2012 4th High values above 75 ppb (data ranges from 76 to 92 ppb). The DFW area 2009-2011 DV was 90 ppb and the preliminary 2010-2012 DV of 87 ppb is still 10 ppb above the standard. The monitoring data demonstrates that the 2006 model predicted levels are below current monitored values and the modeled 2012 DV projections are underestimated by more than 10 ppb at some monitors. Therefore the 2006 levels seem more appropriate to compare to actual 2011 and preliminary 2012 monitored data.

In photochemical grid modeling the modeling domain is broken up into 4 km x 4 km squares that we call grid cells. In this case when we obtain the model value for further evaluation we look at the value for the grid cell the monitor is in and all grid cells immediately touching the grid cell with the monitor (similar to a Tic Tac Toe box with the monitor in the center). The EPA guidance is to use the maximum value from the 9 values to represent the model estimate for the monitor and TCEQ used the average value in some of their analysis. TCEQ indicates, based on one example calculation, that the difference between using the average or maximum modeled values in the grid cells around a monitor would not result in a perceptible difference in arguing that their use of the average value was acceptable. TCEQ's example calculation was for a Future Design Value calculation (based on all emissions in the model) and not for a source apportionment calculation (which uses the model estimate for only the emissions from Wise County in this case). We note the EPA's guidance recommends using the maximum value of the grid cells in the grid cell array around a monitor. From one of the files from TCEQ we were able to evaluate what the differences are when we used the maximum vs. the average value and we did note some differences in source apportionment results. If the SAM had been evaluated using the maximum value, as EPA guidance recommends, the values may have been larger.

II. Analysis of HYSPLIT Model Results:

Issue: The Petitioner claims that the EPA failed to quantify the number of trajectories transecting Wise County before crossing either the Eagle Mountain Lake or the Keller monitor and also failed to quantify the number of trajectories that passed over other counties before passing through Wise County. In each case those percentages were extremely low for the trajectories passing over Wise County. Furthermore, the EPA failed to provide a rationale for how trajectories traversing Wise County indicate contribution from Wise County. Since ozone readings at a monitor are cumulative of the sum of the ozone and the ozone precursors along the trajectory path, the EPA's failure to quantify the number of trajectories through other counties was irrational and in error. Furthermore, the EPA failed to explain how much ozone if any would result from the VOCs from Wise County.

Response: The EPA conducted HYSPLIT analysis of several monitors in DFW for purposes of the Preliminary Technical Support Document or TSD (December 2011) and the Final TSD (April 2012). In the Final TSD we noted that "The HYSPLIT model yields an estimate of the path an air mass has traveled before reaching a monitor at a specific location and time. Specifically, the model provides the centerline of the probable path. By knowing where an air mass has traveled before reaching a monitor where an exceedance has occurred, one can consider what potential areas and emission sources could have contributed to the exceedance." The EPA included trajectory plot maps for the Keller and Eagle

Mountain Lake monitors in both the Preliminary and Final TSDs and also made the individual back trajectory files available for review during the comment period. While the EPA did not specifically state the number of trajectories that transect Wise County in text in the TSD, the plots in the TSDs indicate that 3 trajectory ‘centerlines’ directly traversed Wise County for the Keller monitor, and at least 7 trajectory ‘centerlines’ traversed Wise County for the Eagle Mountain Lake monitor. In addition, some other back trajectories that did not directly traverse Wise County had centerlines near enough to Wise County to suggest a path of upwind influence involving Wise County emissions.

We note that a review of the individual trajectory files shows that several of the days that trajectories passed through Wise County were also days that made up the 1st to 4th highest monitored values, which are the values used in establishing the Design Value at the Eagle Mountain Lake and Keller monitors during the periods evaluated; these individual trajectory files were included in the supporting materials for the EPA’s intended and final designations.⁹

We also considered the amount of emissions in Wise County and the proximity to violating monitors. TCEQ has well established the record that the DFW area ozone levels are NO_x limited and we based our analysis on the amount of Wise County NO_x emissions and their ozone generation potential. In the SAM results for Wise County emissions and comments that TCEQ provided, there was a specific analysis that indicated that almost all of the ozone increases at monitors were due to Wise County NO_x emissions.¹⁰ In general the VOCs from Wise County were not considered to contribute to ozone levels very much.

III. Significance of Contribution of Oil and Gas Activity:

Issue: The Petitioner stated that current oil and gas activity levels in Wise County are unlikely to be contributing significantly to nonattainment in the DFW nonattainment area. The Petitioner noted that oil and gas production and drilling in Wise County is starting to decline and stated that there is no evidence of a correlation between the growth in Barnett Shale gas production development activity and ozone production in the DFW area. The Petitioner expressed concerns that the EPA may have inadvertently

⁹ We note that all this data is available in the record. For the Eagle Mountain Lake Monitor, the following days were the 1st thru 4th High values that set the monitor’s DV. Highlighted in BOLD is the days that EPA’s HYSPLIT analysis indicates potential contribution from Wise County emissions. 2006 (6/14 – 107 ppb, 6/9 – 106 ppb, 6/28 – 98 ppb, 7/18 – 98 ppb); 2007 (**8/14 – 121 ppb**, 8/15 – 101 ppb, 10/04 – 86 ppb, **9/22 – 84 ppb**, 7/25 – 84 ppb); 2008 (8/04 – 98 ppb, **6/18 – 92 ppb**, 6/23 – 86 ppb, 6/19 – 85 ppb); 2009 (**6/25 – 100 ppb**, 6/5 – 92 ppb, 6/26 – 92 ppb, **8/26 – 91 ppb**, **7/2 – 91 ppb**); 2010 (6/4 – 94 ppb, 8/27 – 91 ppb, 8/28 – 83 ppb, 5/29 – 81 ppb). When there was a tie for the fourth high value we looked at trajectories for both days.

¹⁰ Governor Perry’s comment letter dated February 29, 2012, pages 13, “[a]t the Weatherford (Parker County) ozone monitor NO_x emissions from Hood and Wise Counties created 97-99% of the contributed ozone from these counties, while VOC emissions were only responsible for 1-3% of the contributed ozone from these counties.” See Final TSD, pages 6-8; Houston Final TSD, pages 5-7; RTC pages 52-56, including “...the VOC emissions resulting from oil & gas production activities are relatively nonreactive in the photochemical generation of ground-level ozone and that additionally the DFW area is NO_x-limited such that VOC emissions in general do not contribute as much as NO_x emissions to the generation of ground-level ozone.” And “EPA has since reviewed the updated emissions data reported by the TCEQ and notes that the revised numbers do not affect the ranking of the counties for VOC emissions. EPA’s analysis indicates that even with the reduced 2009 VOC emissions data, the emissions from Wise County still contribute to measured violations of the 2008 ozone NAAQS at monitors in neighboring counties. In making our final decision, we considered the reduced emissions and the reduction in drilling activity since 2009.” The Governor Perry’s comment letter dated February 29, 2012, pages 17-21, also referred to other TCEQ documents that further support that DFW area is a NO_x limited regime and changes to VOC levels do not result in much impact in ozone levels: TCEQ 2011 DFW 1997 8-hour Ozone Attainment Demonstration SIP – “APPENDIX E: Protocol for the Eight-Hour Ozone Modeling of the Dallas-Fort Worth Area,” and “APPENDIX D: Conceptual Model For The DFW Attainment Demonstration SIP Revision For The 1997 Eight-Hour Ozone Standard.”

“double-counted” emissions by summing the emissions data from the 2008 National Emissions Inventory with that of TCEQ’s 2009 Special Inventory for the Barnett Shale.

Response: This comment was raised during the comment period. While we did not specifically respond to this comment for the DFW area, the comment was considered by the EPA. Thus it is not appropriate for reconsideration. In the final DFW TSD, the EPA provides two emissions inventories (EIs) of nitrogen oxides (NO_x) and volatile organic compounds (VOCs), which are ozone precursors (pages 7-8). The two EIs are: 1) a 2008 EI of all Wise County sources and 2) a TCEQ 2009 Barnett Shale special inventory. The 2008 EI included revisions to the EI submitted by TCEQ in October 2011 which updated oil and gas sector pneumatic emissions (pages 6-7). The EPA did not add emissions from the Barnett Shale special inventory to the 2008 EI.

The central issue is whether emissions from Wise County contribute to ozone violations in nearby areas. As the record indicates, monitors in the Dallas CSA are violating the ozone standard and the EPA is required to designate areas as nonattainment if they violate the standard or contribute to a violation in a nearby area. As discussed in the RTC and TSD, some of the highest days during the 2006-2010 period included transport of Wise County emissions (including any Barnett Shale-related emissions) to some of the highest ozone exceedances at the Eagle Mountain Lake and Keller monitors, which are two of the DFW area’s monitors with the highest ozone levels. The TCEQ’s SAM also shows that emissions from Wise County (which would include Barnett Shale-related emissions) are transported to the violating monitors and that the amount of contribution could be as high as 50% of the total impact on certain days with high ozone levels.¹¹ TCEQ’s SAM submitted by the Petitioner included the combination of meteorology and emissions from Wise County (including emissions from oil and gas production activity), and the resultant modeling indicated contributions to multiple exceedances of the ozone standard at several monitor sites.

Design values and design value trends are a product of a number of variables, not simply the emissions of one or more types of emissions sources, which is why we perform a five-factor analysis in determining whether an area contributes to a violation of the standard in a nearby area. Decreases in design values over time can occur due to many variables, including decreases in ozone precursor emissions (such as in the DFW Nonattainment area due to federal measures and measures implemented by TCEQ in past ozone attainment demonstration SIPs). The fact that the design value is lower (i.e., that ozone has not “increased”) does not preclude a determination that emissions from Wise County contribute to exceedances at violating monitors in the DFW CSA.

¹¹ See the TCEQ source apportionment modeling files, including the Excel Spreadsheet that was placed in the record during the final action. (Hood-Wise_DVf_Contribution_wPies.xls)