American Gas Association

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August 4, 2017

Attn: Ms. Melissa Weitz
U.S. Environmental Protection Agency
Climate Change Division
Office of Air and Radiation
1200 Pennsylvania Avenue, NW
Washington, DC 20460

Re: AGA Comments on EPA Updates under Consideration for the Inventory of U.S. GHG Emissions and Sinks – Uncertainty Estimates for Petroleum and Natural Gas Systems

Dear Ms. Weitz:

The American Gas Association (AGA) appreciates the opportunity to comment on the U.S. Environmental Protection Agency's (EPA) consideration of updates to uncertainty estimates for methane emissions from natural gas systems in EPA's Inventory of U.S. Greenhouse Gas Emissions and Sinks (GHGI). These comments are in response to the EPA memo that requests stakeholder feedback.[1]

AGA member companies have made concerted efforts to upgrade our nation's natural gas system, which has contributed significantly to a declining emission trend from natural gas distribution systems. As the most recent GHGI shows, natural gas emissions from distribution systems have declined by 75 percent since 1990, even as miles of distribution mains expanded 30 percent to serve nearly twice as many customers. AGA appreciates EPA's ongoing efforts to improve emission estimates based on new research and to revisit uncertainty estimates in the GHGI.

AGA and its members are directly affected by the GHGI because it provides the best available estimate of natural gas emissions from our members' operations – including natural gas local distribution, transmission, and storage. AGA represents more than 200 local energy companies that deliver clean natural gas throughout the United States. There are more than 73 million residential, commercial and industrial natural gas customers in the U.S., of which 95 percent — more than 69 million customers — receive their gas from AGA members.

AGA is an advocate for natural gas utility companies and their customers and provides a broad range of programs and services for member natural gas pipelines, marketers, gatherers, international natural gas companies and industry associates. This gives AGA a broad perspective and deep industry knowledge across the natural gas value chain. Today, natural gas meets more than one-fourth of the United States' energy needs. If our members are to continue to fulfill that critical role across the country, it is important to demonstrate how our members' efforts to modernize their systems and practices are continuing the declining trend in emissions.

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[1] EPA Memo, "Inventory of U.S. Greenhouse Gas Emissions and Sinks 1990-2016: "Updates Under Consideration for Natural Gas and Petroleum Systems Uncertainty Estimates," (June 2017).

For that reason, AGA supports continued funding and resources for the GHGI program so that EPA can improve the GHGI by incorporating new, more robust emissions data as soon as it becomes available.

EPA has done this by updating the GHGI in April 2016 with robust emissions data from the Environmental Defense Fund (EDF) – Washington State University (WSU) study of 13 natural gas distribution systems across the country. We thank you for that. But there are more new data sets available now, and we urge EPA to include those too, in order to provide an increasingly accurate picture of natural gas emissions from production to end user, demonstrate the true value of natural gas, and help focus efforts where they will be most cost-effective.

A. AGA Supports Evaluation of Uncertainty Estimates; But the Timing is Wrong -- EPA Should Not Attempt to Update Uncertainty Estimates for Transmission and Storage Until EPA Can Include: (1) Subpart W Data and (2) PRCI Subpart W Data Analysis

AGA appreciates EPA's efforts to evaluate the GHGI and to improve estimates of emissions and associated uncertainty. AGA supports the incorporation of new data into the process, and understands that resource and data limitations limit the ability to complete comprehensive updates to GHGI uncertainty estimates every year. As noted in its recent memo, EPA is considering updates for the natural gas and petroleum systems uncertainty analysis for the 1990-2016 GHGI (to be finalized in April 2018). We understand EPA is considering updates to reflect new information and revised Inventory methodologies, and is seeking feedback on the updates.

However, as discussed below, AGA is very concerned that EPA's proposed 2018 update apparently would *not* include extensive measurement data that is available for transmission and storage emission sources. We think it would be a wasteful and even detrimental exercise to try to update the uncertainty analysis for these sources without considering the extensive, updated emissions data in Subpart W. Further, an upcoming study analyzing the Subpart W data for transmission and storage will provide a particularly useful resource for that purpose. EPA should postpone its uncertainty analysis until that study is released later this year.

As you know, natural gas transmission pipeline and storage operators have collected extensive data over the past 6 years to comply with Subpart W of the GHG Reporting Program (GHGRP). *Over ten thousand measurements* have been completed to date. Since the GHGRP is intended to provide information to improve our understanding of national GHG emissions and inform policy decisions, it is frustrating to the affected community to continue to conduct annual measurements (e.g., emissions from compressor vents) and not see that data utilized.

AGA urges EPA to take advantage of that extensive data. We urge EPA to take the following steps to use robust Subpart W data when updating the uncertainty analysis.

First, in the 2018 GHGI, EPA should evaluate natural gas system emission sources that are not required to conduct Subpart W measurements (e.g., compressors) and sources that are not required to provide estimates of actual emissions (e.g., compressor station blowdowns).

Second, for inclusion in the 2019 GHGI, EPA should analyze Subpart W data for natural gas emission sources that provide quantified data (e.g., vent measurement and pipeline blowdown volume calculations). In particular, we urge EPA to incorporate learnings from a Pipeline Research Counsel International (PRCI) project in which researchers are gathering and analyzing Subpart W data from transmission compressor stations and underground storage facilities. PRCI expects to publish reports for the transmission and storage segments in fall 2017. We understand the reports will provide a robust basis for improving emission factors based on compressor measurements as

well as data for blowdown emissions from compressor stations and transmission pipelines. The PRCI reports will also discuss the frequency and size of "large leaks" based on the measurement data, which should be useful in narrowing the bands of uncertainty.

Since the PRCI study will be available this fall and will analyze the extensive Subpart W data on transmission and storage emissions, AGA recommends timing the review of uncertainty estimates for those emission sources to allow the agency to incorporate that significant dataset in its uncertainty analysis. It is especially important to avoid a premature uncertainty "update" that omits this important data, because EPA has said it does not conduct uncertainty updates every year. We urge EPA not to perform a premature uncertainty analysis that locks in old, faulty assumptions for the foreseeable future. Please postpone the uncertainty update for transmission and storage so that you can leverage your limited resources by using PRCI's analysis of Subpart W data.

B. AGA's Responses to EPA's Request for Stakeholder Feedback

EPA's general approach to uncertainty analysis:

EPA requests feedback on its general approach to perform a detailed uncertainty analysis for the sources that cover a significant percent (e.g., 75%) of gross emissions from natural gas and petroleum systems. Realizing resources are limited and analysis provides diminishing returns for sources that comprise a small percentage of emissions, AGA supports this approach, which is item 1a in EPA's request for stakeholder feedback.

In item 1b, EPA request feedback on calculating uncertainty for a select year, then assuming the same relative uncertainty for all other years in the time series. AGA recommends additional considerations for the time series review. For an emissions estimate, there are two primary components, typically an emission factor and activity data. There is uncertainty associated with each parameter. For time series assumptions (e.g., linear interpolation over 20+ years), there may be instances where there are obvious uncertainties associated with the time series scaling or interpolation techniques. Rather than avoiding the topic by assuming the same uncertainty across the time series, EPA should, at a minimum, provide qualitative judgment on the potential for different or higher uncertainties across the time series based on the methods and assumption used for emission factor and activity data interpolation or extrapolation.

Availability of additional data relevant to characterizing uncertainty, understanding systematic errors, and how improved uncertainty results can target GHGI improvements:

Several EPA requests are related to method improvements, such as: characterizing uncertainty parameters (item 2); other studies on uncertainty for comparison (item 3); understanding and improving emission estimation models and PDF's of emission and activity factors (items 4 and 5); improving characterizations of extreme datasets (item 6); and, how improved uncertainty results can be used to target GHGI improvements (item 8).

Other information or data that is available from the GHGRP can inform all of these topics. For example, *measurement data* from Subpart W can provide additional data and information that informs all of these topics. Thus, AGA questions whether it is appropriate to undertake a reassessment of uncertainty at this time, because analysis of that data is lacking to date.

There are now six years of compressor vent measurements (i.e., 2011 – 2016 data) from hundreds of transmission compressor stations and underground storage facilities that are required to measure reciprocating compressor rod packing leakage, centrifugal compressor wet seal

degassing vent emissions, blowdown valve leakage, and isolation valve leakage. Measurements of these emission sources have also been conducted at gas processing plants. Thus, tens of thousands of actual *measurements* have been conducted. Those compressor sources are the technical basis for reciprocating compressor and centrifugal compressor (wet or dry seal) emission factors used in the current GHGI. The compressor emission factors are a composite of emissions from the different compressor sources (rod packing, isolation valve, etc.), along with assumptions regarding typical annual operating time in different operational modes (i.e., operating, standby-pressurized, or shutdown and de-pressurized operating mode). As shown in Table 1 of EPA's memo, reciprocating and centrifugal compressor fugitive emissions from transmission and processing segments are 3 of the top 7 sources in the list of top 12 sources. The Subpart W measurement data should be analyzed to improve emissions estimates, and the associated uncertainty, for compressor fugitive emissions.

For the transmission and storage segments, the PRCI project is gathering and analyzing compressor measurement data from transmission compressor stations and underground storage facilities. Data from the first three years of Subpart W reporting (2011 – 2013) indicates compressor emissions are lower than EPA's current estimates. Data from 2014 – 2016 is currently being integrated with the other three years, and a PRCI report should be available later this year. The PRCI project is also reviewing information on facility leak surveys (where Subpart W estimates leak emissions from other components based on a count of leaks by component type and "leaker" emission factors), emissions associated with leaking condensate tank dumps valves at compressor stations, and blowdown emissions at compressor stations and along transmission pipelines. The latter emission source reported for the first time in 2016. These are all key sources within the transmission and storage segments, and compressor fugitive emissions are included in the "top 12" list from the EPA memo.

The Subpart W data, as presented in PRCI project reports, provides additional data on emission estimates for key sources, information on uncertainty (e.g., for the emission factors for reciprocating compressor fugitives) from a much larger dataset than ever previously available. It also provides information on appropriate emission models for these emission sources as well as the distribution of leak sources (e.g., the size and frequency of very large leaks). These data will very likely provide a means to significantly improve the emission estimate for transmission and storage compressor emissions, and the uncertainty associated with the estimates.

Since EPA only revisits GHGI uncertainty estimates periodically, AGA recommends refraining from this task for sources that include measurement data from the GHGRP until such time that the Subpart W data is incorporated. Based on the current schedule, it seems reasonable to wait for the next GHGI reporting cycle (i.e., 2019 report) to include GHGRP Subpart W data analysis in the emissions and uncertainty estimates. However, that process needs to continue to occur in the coming months to ensure it is possible to include that information for transmission and storage segments in the 2019 GHGI.

EPA query regarding additional information from industry experts for sources listed in Table 3 and Table 4 (Item 2):

EPA solicits information about characterizing uncertainty parameters for sources listed in two tables in its memo. The list includes engine methane emissions (from multiple segments). That emissions source is an example where data could be gathered to improve GHGI estimates and

better understand uncertainty. Industry experts and available information (e.g., published papers) could inform this discussion.

The GHGI uses a single methane emission factor for all engine types and segments. That does not accurately represent operations, so the current model is flawed. The emission factor is probably reasonably accurate for lean burn (LB) engines, which are the prevalent engine type in transmission and storage, but not for rich burn (RB) engines. RB engines are used in all segments, but are more common for smaller applications in upstream operations (gathering and production). RB engine exhaust methane emissions are lower than the current emission factor, and many units include nonselective catalytic reduction (NSCR) emissions control, which results in even lower methane emissions.

To improve estimates and reduce uncertainty, EPA could revise activity data by segregating the estimated annual hp-hrs for each segment into at least two categories – RB and LB. Review could provide insight into more appropriate EFs to use for each segregated group and to develop activity data. Industry experts could inform this question, and there is some information available from published papers, and other EPA activities. For example, background analysis for the engine NSPS (Part 60, Subpart JJJJ) and RICE NESHAP (Part 63, Subpart ZZZZ) include estimates of engine population, etc. by segment and subcategory (size, RB or LB). In addition to item 2, this topic relates to items 4 and 8 from EPA's list.

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AGA appreciates the opportunity to comment. If you have any questions, please contact me at (202) 824-7340.

Respectfully Submitted,

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