January 21, 2015

Richard Corey
Executive Officer
California Air Resources Board
1001 "I" Street
Sacramento, CA 95814

Re: Additional Comments on the Low-Carbon Fuel Standard and Revisions to the CA-GREET Model

Dear Executive Officer Corey:

The California Natural Gas Vehicle Coalition (CNGVC), NGVAmerica (NGVA), and the Coalition for Renewable Natural Gas (RNGC) are pleased to provide these latest joint comments regarding ARB's proposed reauthorization of the Low Carbon Fuel Standard (LCFS) regulation and proposed update to the CA-GREET model (CA-GREET 2.0). For more information about our three organizations and respective memberships, please refer to the previous formal comment letters (dated October 24 and December 15, 2014) that we uploaded to the ARB LCFS comments website.

As stated in those letters, we continue to strongly support ARB's re-authorization of the LCFS regulation. We are committed to continue working closely with ARB staff. Like ARB, we want to ensure that the proposed CA-GREET 2.0 model is based on the most up-to-date, accurate methodologies and data available at the time of its expected adoption in July 2015.

Recent Cooperative Efforts and Progress by ARB Staff

Our three organizations greatly appreciate the time and effort put forth by ARB staff over the last 60 days to meet with our representatives and address our specific concerns. We are pleased that ARB has made changes that corrected erroneous information and updated obsolete inputs found in early drafts of CA-GREET 2.0.

We also appreciate your general willingness to work with our industry. Most recently (January 11, 2015), you sent a cooperative, positive email communication to CNGVC President Tim Carmichael. In that email, you confirmed ARB's intent to continue working with California NGV industry stakeholders towards the following specific goals:

- Conduct further discussions to better quantify lifecycle GHG emissions;
- Understand and incorporate new research results as they become available over the next 12 months;
- Continue to engage with all stakeholders on CA- GREET 2.0, right up until the Board meeting in July 2015 at which the LCFS item will be heard (although, you noted that no "additional workshops" have yet been planned or scheduled);
- Incorporate any further updates to CA-GREET 2.0 through ARB's normal 15-day change rulemaking process; and

- Draft proposed "resolution" language for the Board's consideration at its February meeting; this resolution will confirm the previous bullet.

Ongoing Concerns Needing Resolution

Notwithstanding the significant cooperative efforts by ARB staff and the clear progress that has been made, our organizations and respective members continue to have significant and substantive concerns with Staff's direction towards finalizing LCFS recommendations to the Board for the July 2015 meeting. Our concerns fall within two general areas: 1) unresolved technical issues with the CA-GREET 2.0 model; and 2) the lack of a formal, transparent process for stakeholders to provide inputs and/or new information to help correct such problems. Addressing both issues will improve the CA-GREET model's accuracy and enhance the LCFS Program's fidelity, credibility and defensibility.

Within this context, our specific concerns are described below.

1. Unresolved Technical Issues

There are several major issues associated with the current CA-GREET model's natural gas pathways that remain unresolved to our satisfaction. These unsettled technical issues each relate to the critical parameter of fugitive methane emissions (both upstream and downstream). All issues were originally described in the two detailed letters and reports[1] that we previously submitted to ARB via the formal LCFS comment process. The following summarizes our updated technical concerns.

a) Tailpipe Methane Slip Emission Factors – This is our industry's most-important technical concern with the current version of CA-GREET 2.0. As we have described in past letters, the model's methodology and the data used to calculate methane tailpipe emission factors (EFs) were inaccurate in the first iteration of the proposed CA-GREET 2.0. We appreciate that ARB staff were responsive to our comments and made adjustments to the model, which then emerged in the current working draft of CA-GREET 2.0. Unfortunately, the quality of the subsequent data and methodology for tailpipe methane emissions in CA-GREET 2.0 remains poor. The new methodology utilizes modeled emission factors for gasoline and diesel from an outdated version of the EPA MOVES model, combined with unreferenced scaling factors to convert conventional fuel EFs to natural gas EFs. This approach is not scientifically defensible, and the resulting estimates for methane emissions are not consistent with recent vehicle testing and engine certification data for heavy-duty vehicles.

   We continue to strongly recommend that ARB incorporate the most up-to-date tailpipe methane methodology and emissions factors based on actual NGV emissions data. Peer-reviewed sources include SCAQMD's report from West Virginia University on in-use testing of heavy-duty vehicles (July 2014), and the soon-to-be released Argonne National Lab (ANL) Heavy Duty Vehicles report. Notably, the methane slip values in the ANL report for Class 8 heavy-duty trucks are four to six times lower than those currently being used by ARB staff. It appears that ARB staff already have an advanced copy of the ANL report, as it is referenced in the December 16, 2014 CA-GREET 2.0 Supplemental Document.

b) Methane Leakage from RNG Production Facilities – We appreciate that ARB staff responded to our concerns and reduced (from two to one percent) the assumed methane leakage factor for facilities

[1]This refers to the ICF International report commissioned by our organizations and submitted to ARB with our October 24, 2014 letter. Additional technical comments about CA-GREET based on this report were submitted to ARB with our December 15, 2014 letter.

that capture landfill gas. However, the current draft of the CA-GREET 2.0 continues to neglect the fact that a leakage rate of even one percent is both unfounded and inconsistent with existing Federal and state level regulations to control methane leakage at landfills, which require industry best practices to comply. The ANL reports and methodology cited by ARB are based on European studies for anaerobic digester facilities; they are simply not applicable to U.S. RNG production from landfill gas. U.S. landfills are subject to New Source Performance Standard (NSPS) operational requirements for collection and control systems. Moreover, California landfills are subject to more-stringent landfill methane rules requiring leak testing of any components that contain landfill gas under pressure. This includes the entire upgrading and treatment system. Specifically, California regulation 17 CCR 95464 (b)(1) sets very stringent leakage limits of 500 ppmv[2] and would translate into less than 0.1 percent leakage. Under Federal law, 40 CFR 60.753 prohibits <u>any</u> leakage of gas from landfill collection and processing systems. Consequently, we continue to support the position that the methane leakage rate at RNG production facilities located at any North American landfill is effectively *zero*. We see no credible or defensible basis for staff's position that a leakage rate of one percent must be assumed.

c) <u>Methane Leakage from Conventional Natural Gas Processes and Transport</u> – Assumptions currently in CA-GREET 2.0 for this category of methane leakage are based on a national-level EPA methodology. Inputs come from the 2014 national GREET model. These leakage rates are lower than the 2013 version of the national GREET model, and reflect the downward trend in methane emissions from the natural gas supply chain over the last 24 years (during very significant increases in natural gas production). Our concern is that using these emissions rates in the current CA-GREET 2.0 model is clearly not representative of California's natural gas distribution systems or the primary gas-producing basins supplying natural gas to California. ARB's ISOR (Appendix D) acknowledges that the release of more up-to-date studies on system leakage are imminent; these will <u>include California-specific data</u>. While we concur with ARB staff's apparent decision to wait for release of these studies before revising leakage values, we want to emphasize the importance of incorporating this new data set before CA-GREET 2.0 is finalized and implemented.

   To further improve the accuracy of model inputs and outputs, we continue to recommend that ARB develop a California-centric assessment of natural gas systems and supplies, similar in concept to the OPGEE model used to calculate CI values for petroleum fuels. Our organizations and members are ready to assist by providing inputs for this model. For example, Southern California Gas Company reports that modernization efforts over the last 20 years have reduced leakage rates in its territory to levels <u>20 to 80 percent lower than those assumed in the currently proposed CA-GREET 2.0 model</u>. Other utilities and natural gas producers indicate that actual leakage rates attributable to California gas supply are significantly lower than assumed in the proposed CA-GREET update. We strongly urge ARB to work with these industry resources to incorporate and account for unique attributes of the California natural gas system.

d) <u>Methane Leakage as a User Modifiable CA-GREET Input</u> – We request that ARB make methane leakage rate a user-modifiable input in the CA-GREET model. This will enable fuel producers *that are able to provide supporting documentation* to submit site-specific values for methane leakage.

e) <u>Double Counting of Methane Leakage During Pipeline Distribution</u> – In the current draft of the CA-GREET 2.0 model, methane leakage during pipeline distribution (i.e., via lower-pressure pipelines) is

[2] Parts per million, by volume

erroneously being double counted. We have made ARB staff aware of this issue, and expect that the error will be corrected before ARB finalizes and implements the CA-GREET 2.0 model.

2. Concerns with the Stakeholder Review Process

We have the following significant concerns regarding the process used by ARB staff to work with our industry (and other stakeholders) in revising the LCFS and updating the CA-GREET model. While we appreciate the time and attention staff has taken to meet with us thus far, these meetings have been more on an ad-hoc basis and at the request of the NGV industry. Building on the productive dialogue to date, we see opportunity for further improvement of the science, assumptions and calculations being used in the CA-GREET model.

Further, commitments have been made by ARB staff during past ad hoc meetings that have not been reflected in subsequent releases of the CA-GREET model and/or other LCFS Program supporting documentation. An example is provided below in item 2.a).

It is for these reasons that we believe a more formal process is warranted. Such a process will help ensure that the best-available data and science are used in updates to the LCFS Program. It will establish a clear, transparent and formal record for stakeholder engagement on these issues, thereby resulting in defensible and credible updates for the revised CA-GREET model and LCFS Program.

a) Publication of CI Values in the ISOR - In our formal joint letter of October 14, 2014, we urged ARB to refrain from publishing preliminary CI values for any fuel pathway, including those for CNG, LNG and RNG. We pointed out that much uncertainty exists with key parameters that dictate CI values; this is especially true regarding fugitive methane emissions during both upstream and downstream processes. Furthermore, more-robust data on such critical issues will emerge over the next six to twelve months; it is highly likely that some of this will be available to ARB staff well before the Board considers adoption of the revised LCFS in July 2015. We emphasized that CI values are an important determinant for end-user fleets when considering a potential switch to NGVs, and publishing interim values would only serve to introduce confusion into the marketplace. This could potentially destabilize the LCFS credit trading market, delay or halt investment plans developed to comply with the LCFS, and/or create hesitation among end users as they consider the adoption and use of lower-carbon transportation options for their fleets. Given the ability for an end-user fleet to make strong investments in NGVs and fueling infrastructure today, and transition these operations to very-low-CI RNG in the future (if not immediately), it is extremely important for the State to encourage rather than hinder such adoption in the market. Given these facts, we requested that ARB continue to use existing CI numbers from the still-active CA-GREET model (1.8b), until better and newer data are available.

   During a meeting on December 12, 2014 at ARB headquarters, your staff indicated it would be necessary to publish updated CI values, even if preliminary. Staff cited the need to include “illustrative scenarios” in the ISOR for various fuel pathways. In follow-up discussions, Staff communicated that ARB management was willing to compromise by using a combined CI (70 g/mj) for conventional natural gas (fossil CNG and LNG), and a CI range (15 to 25 g/mj) for RNG. Our NGV industry team accepted that approach – although our clear preference has been that ARB not publish any new CI values. We have been consistent that continued use of existing CI values from CA-GREET 1.8b makes the most sense; meanwhile, ARB could note that they would most likely change upon implementation of the revised LCFS program (2016).

   Unfortunately, for illustrative scenarios in the actual ISOR (Appendix B), Staff used a single CI of 25 for RNG rather than the range of 15 to 25, to which Staff had committed. While this change may have been

inadvertent, our concern is that Staff did not follow through on an important commitment, upon public release of the ISOR and its appendices. This type of disconnect is a key reason that we are requesting a more formal process for obtaining, documenting and responding to stakeholder inputs (see the next item).

The ramifications to such process breakdowns can be significant. The ISOR language notes that "these values approximate the average CIs expected to be applied to these fuels." As such, we are very concerned that publishing only RNG's upper CI value (which is itself a place holder) will have a lasting and negative effect on decisions to make capital investments in California RNG infrastructure and related vehicle deployments. We strongly believe that the draft ISOR should have incorporated the range of 15 to 25 per the agreement made with Staff during our December 12 meeting.

b) Lack of a Transparent, Effective Process to Incorporate Stakeholder Input – Issues such as the one described above (the CI range for RNG) point to the need for a more effective and transparent process for ARB staff to work with stakeholders to revise this very important regulation and supporting model. As previously stated in our formal letters and during meetings with Staff, we believe it is essential that ARB implements an improved process to obtain and document public input, as well as provide a timely and iterative approach to reviewing and integrating the latest technical information. This should include establishment of an ARB-industry working group that can convene several times within the period between the February 19-20th and July 23-24th board meetings. This will help ensure that legitimate stakeholder concerns and questions are addressed, while also improving the pipeline of useful technical inputs from industry to ARB staff.

This need for stakeholders to make CA-GREET 2.0 inputs during a more formal, transparent process is of paramount importance to our industry. We have been repeatedly assured by ARB staff that "nothing is cast in stone" for CA-GREET 2.0, and that changes can routinely be made by ARB right up until the Board considers adoption in July 2015. However, much of the critical details remain a mystery. For example, we have been told by Staff that after the LCFS issue comes before the Board at its February 2015, "the public record will be closed" until the LCFS Program is again heard at the July 2015 board meeting.

Thus, under a worst-case scenario, our industry assumes that: 1) no formal meetings could take place between the February and July board meetings, 2) ARB staff would not continue to meet with our industry on these issues, 3) no additional data could be considered, and 4) no public testimony could be heard at the July board meeting. If this is the case (we do not have formal clarification and confirmation), we have very significant concerns that ARB's process will not be able to accommodate further industry inputs needed for important CA-GREET 2.0 model modifications. Again, adoption of a more formal and public process that can accommodate critical emerging information will help make this program better for ARB, program stakeholders and the general public.

As noted earlier, we do appreciate your recent email to CNGVC President Tim Carmichael that pledges ARB staff to "continue to engage with stakeholders" up to the July Board meeting. We urge you to now act on this, through the establishment and scheduling of an NGV industry working group. We recommend convening this group for up to three full-day working sessions before Staff finalizes its recommendation to the Board. Our organizations stand ready to engage in such a working group to support ARB staff in the development of a CA-GREET model that incorporates the best-available methodology and data inputs.

Summary of Conclusions and Recommendations

Our three organizations continue to strongly support reauthorization of the LCFS regulation. We genuinely appreciate the cooperation that ARB staff have shown in working with our industry representatives to improve the program, especially the critically important CA-GREET model. Leading up to the February and July Board meetings, we urge you to 1) expeditiously address unresolved technical issues in the current draft CA-GREET 2.0 model, as identified in this letter; 2) fully integrate critical new information that is likely to emerge in the coming months, and 3) plan, schedule and implement a robust public workshop process over the next several months that includes establishment of a natural gas industry working group.

Thank you for the opportunity to comment. We look forward to working with ARB staff on this important issue. If we can provide additional information, please do not hesitate contact any of us.

Sincerely yours,

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