Re: Appendix A to the Regulation for the Mandatory Reporting of Greenhouse Gas Emissions - Comments by

David L. Hagen, May 17, 2008
61485 CR 13, Goshen IN 46526

1 **Exclude Biomass Use**

The prescriptions for reporting biomass fuels in this document appear onerous and heavy handed. They act in direct opposition to the intent of the legislation to promote sustainable energy use. Recommend deleting ALL reporting of biomass, or at least excluding ALL biomass use less then 25,000 metric tons/year. E.g., on page A-32 (2), exclude biomass.

On p A-27 (9), is +/-5% appropriate for biomass and landfill gas? Varying moisture content and variations in land fill gas can give heating value variations far higher than this. Both are nominally renewable resources and nominally do not contribute to increasing atmospheric CO2 on a steady state basis. E.g., on pages A-103 (2) and (3). It would appear important to evaluate the fossil fuel based carbon dioxide and exclude the biomass based carbon dioxide.

2 **Uncertainty goals rather than prescription**

The document focuses on prescription rather than on the end goal of the desired "accuracy" or uncertainty. Recommend specifying a desired long term uncertainty goal as a function of size and fossil vs biomass. Then let operators select frequency based on the stability of their instrumentation and feedstock. E.g., A101. Annual measurements may be overkill for highly stable operations and equipment. Conversely highly variable operations and poor quality equipment may require more frequent adjustments and calibration.

3 **Staged verification:**

The mandated prescription requiring all operators to obtain verification during the same period with gaps of two years in between will result in an onerous boom/bust work and profit cycle for verification operators. Recommend the example set in the Senate of 1/3 of locations being tested in each year of a three year cycle. Allow operators to select which year to verify on a first come first serve basis.

4 **Fuel & biomass testing**

The rigid testing procedure to evaluate fuel value appears heavy handed and without reference to the overall uncertainty desired. Recommend specifying a desired uncertainty, and allow operators to select the frequency of testing according to their fuel variability and their relative size. E.g., allow small operators to use standard fuel values or only test occasionally. Allow operators to accumulate samples that are then tested on a less frequent basis. E.g. every quarterly, semi annually or annually for smaller operators.

5 **Size: 25,000 vs 2,500 metric tons**

Per ARB resolution 07-54, "3. Annual reporting of GHG emissions . . .sources that emit over 25,000 metric tonnes (sic) per year of CO2 from stationary source combustion is necessary to include the most significant California GHG emissions sources." There are numerous references to 2,500 metric tons. Recommend correcting all these to 25,000 metric tons unless otherwise authorized by the ARB or by clear uncertainty guidelines in emissions reporting.

Detailed recommendations & corrections:

6 Appendix A-3 unit Re: “Tonnes (metric)”. In the United States the correct term is metric ton. See: "Metric System of Measurement: Interpretation of the International System of Units for the United States", Federal Register notice of July 28, 1998, 63 F.R. 40333. See: NIST SP-811, Guide for Use of SI Units, Barry N. Taylor, 1995.

7 Appendix A-3 Unit Conversions. Re Btu conversion factors. There are at least five Btu definitions. Specify the temperature or type of Btu being specified.

8 Appendix A-3 Unit Conversions. Correct “Kilograms” to “kilogram”, “Kilometer” to “kilometer”, “Kgf” to “kgf”, etc. Add “(Mg)” after “Megagrams”.

9 Appendix A-5 Section 4. Specify the time frame for the quantity threshold. E.g “25,000 metric ton/year threshold” and “2,500 metric ton/year threshold”.

10 Table 3. Correct “Kg” to “kg”.

11 Appendix A-8. Re: significant units in fuel type. All fuels show two significant figures while Municipal Solid Waste is listed to five significant figures and is yet one of the most variable. Change to 91 kg CO_2/MMBtu.

12 Appendix A-4 95102 Definitions (a) (1) “Accuracy”.

Accuracy is an informal term. If you wish quantitative results, this should be changed to “Uncertainty”. See NIST publications relating to Uncertainty.

“Uncertainty of Measurement Results from NIST”

“Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results”

See Book: Measurement Uncertainty, 3rd Edition

Measurement Uncertainty: Methods and Applications, Fourth Edition

Ronald H. Dieck, (2006) ISA, ISBN: 1556179154

13 A-5 (11) Add conversion to liters.

14 A-5 (17) Add note that there are four other definitions of Btu.

15 A-5 (83) Include “bitumen, shale oil.”

16 A-14 (105) Correct “pressure” to “potential difference”. Add “One Watt is the power equal to one joule of energy per second.”

17 A-15 (115) Correct “Metric tonne” to standard US usage of “metric ton”. Correct throughout the document and appendix.

See: "Metric System of Measurement: Interpretation of the International System of Units for the United States", Federal Register notice of July 28, 1998, 63 F.R. 40333

NIST SP-811, Guide for Use of SI Units, Barry N. Taylor, 1995.

18 A-22 (181) 760 mm is incorrect with 60 deg. F. Correct STP definition to read: “Standard conditions” or “Standard Temperature and Pressure”, unless otherwise designated, refer to the USA customary value per the American Gas Association (herein “STP(68)”) of: “a temperature of 15.6 degrees Celsius (68 degrees Fahrenheit) at a pressure of one atmosphere (101.325 kPa).” Some citations refer to the Compressed Gas Institute value (herein “STP(60)”) of: “a temperature of 20 degrees Celsius (60 degrees Fahrenheit) at a pressure of 762 mm (30") mercury.” (E.g., designate on page A-97 etc.)

19 A-26 (6). Specify the time frame. E.g., “20,000 metric tons/year”.

20 A-27 (9). “Accuracy” (as noted above) is not used for quantitative measures. Correct to “uncertainty”. See “uncertainty guidelines” at NIST.gov.

21 A-62 95112. Include “cooling” or Combined Cooling, Heat, and Power.”