



November 8, 2022

Kathleen Kozawa, Manager
Program Assessment Section
Air Resources Board

Comments to the October 18, 2022 Public Workshop: AB 1900 Proposed Biomethane Monitoring Recommendations, CARB Supplement Report

Dear Ms. Kozawa:

We are submitting questions about the process behind CARB's supplemental report to OEHHA's 2020 biogas recommendations on behalf of Climate Action California and 350 Humboldt, two groups that are extremely concerned about air pollution, the burning of biomass for energy, and the introduction of biomethane into the natural gas distribution system.

1. Why is the H₂S trigger level for biomethane more than 10 times higher than that of fossil methane?
2. Why is Hg not being considered as a Contaminant of Concern for biomethane?
3. Why isn't fossil methane being tested for the rest of the Contaminants of Concern in this table? There is no obvious reason why some of them would not be present since the fossil methane arose from the anaerobic decay of plant and animal matter just as does biomethane. *We suggest at the very least that fossil gas be tested at several locations to determine what actual impurities are present. As a case in point, a recent California [study](#) showed that fossil methane contains a surprising amount of benzene.*

The present impurity standards for pipeline fossil methane are given in the following [link](#). Quoting (the bolding is ours):

"The raw natural gas must be purified to meet the quality standards specified by the major pipeline transmission and distribution companies. Those quality standards vary from pipeline to pipeline and are usually a function of a pipeline system's design and the markets that it serves. In general, the standards specify that the natural gas:

- *Be within a specific range of heating value (caloric value). For example, in the United States, it should be about 1035 ± 5% BTU per cubic foot of gas at 1 atmosphere and 60 degrees Fahrenheit (41 MJ ± 5% per cubic metre of gas at 1 atmosphere and 15.6 degrees Celsius).*
- *Be delivered at or above a specified hydrocarbon dew point temperature (below which some of the hydrocarbons in the gas might condense at pipeline pressure forming liquid slugs that could damage the pipeline).*
- *Dew-point adjustment serves the reduction of the concentration of water and heavy hydrocarbons in natural gas to such an extent that no condensation occurs during the ensuing transport in the pipelines*

- *Be free of particulate solids and liquid water to prevent erosion, corrosion or other damage to the pipeline.*
- *Be dehydrated of water vapor sufficiently to prevent the formation of methane hydrates within the gas processing plant or subsequently within the sales gas transmission pipeline. A typical water content specification in the U.S. is that gas must contain no more than seven pounds of water per million cubic feet (MMCFD) of gas.*
- *Contain no more than trace amounts of components such as hydrogen sulfide, carbon dioxide, mercaptans, and nitrogen. The most common specification for hydrogen sulfide content is 0.25 grain H₂S per 100 cubic feet of gas, or approximately 4 ppm. Specifications for CO₂ typically limit the content to no more than two or three percent.*
- *Maintain mercury at less than detectable limits (approximately 0.001 ppb by volume) primarily to avoid damaging equipment in the gas processing plant or the pipeline transmission system from mercury amalgamation and embrittlement of aluminum and other metals.”*

Aside from limiting water content and solids and specifying heat content, the main impurities regulated are mercaptans, nitrogen, CO₂ (less than 3%), H₂S (less than 4 ppm), and Hg (less than .001 ppb by volume). The proposed CARB standards for biomethane (as presented in the workshop [slides](#)), however, fail to show either CO₂ or Hg as a contaminant of concern, and show a trigger level for H₂S of 63 mg/m³ which calculates to 45 ppm H₂S per mole of CH₄ or 88 ppm by weight:

Thank you for the opportunity to submit these questions. We will be in touch shortly in hopes of scheduling a call to discuss.

Sincerely,



Stephen Rosenblum, Ph.D., Chemistry
For Climate Action California



Daniel Chandler, Ph.D.
For 350 Humboldt