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August 10, 2011

Mary Nichols, Chairperson
California Air Resources Board
1001 I Street
Sacramento, CA 95812

Dear Ms. Nichols:

Subject: **CITY OF LOS ANGELES, BUREAU OF SANITATION COMMENTS ON REVISED DRAFT ON CALIFORNIA CAP GREENHOUSE GAS EMISSIONS AND MARKET-BASED COMPLIANCE MECHANISMS**

BACKGROUND:

The City of Los Angeles (City), Bureau of Sanitation (Bureau) is responsible for collecting, recycling, and processing residential curbside solid waste. The City utilizes a four-bin system to collect residential curbside solid waste from over 740,000 residences: blue bin (recyclables), green bin (green waste), black bin (refuse), and brown bin (horse manure). Over sixty-five percent of the total solid resources material generated by the City is currently beneficially reused or recycled. A majority of the remaining (~3,300 tons per day (tpd)) is sent for landfill disposal with a small portion (100 tpd) is sent to the Southeast Resource Recovery Facility in the City of Long Beach for energy recovery.

The City has set a goal of 70% diversion rate by 2013 and a zero waste goal of 80% diversion rate by 2025. In 2007, the City adopted GREEN LA: An Action Plan to Lead the Nation in Fighting Global Warming, which set the goals of reducing greenhouse gas (GHG) emissions by 35 percent below 1990 levels by 2030, increasing the City's use of renewable energy to 40 percent by 2020.

To assist in achieving the City's landfill diversion and GHG reduction goals, the Bureau has launched an Alternative Technologies Program for processing post-source separated municipal solid waste (MSW, aka black bin waste). This program aims to reduce reliance on urban landfills, increase landfill diversion rate, generate renewable energy, and reduce GHG emissions.

In February 2007, the Bureau released a Request for Proposals for the establishment of Alternative Technology facilities to process its black bin waste for resource recovery and energy production. Several different Alternative Technologies including physical, biological, and thermal technologies were proposed and evaluated under two categories, namely commercial and emerging technologies. Commercial technologies are proven technologies capable of processing 200-1,000 tpd of residual MSW while emerging technologies are those capable of processing up to 200 tpd of residual MSW.

In June 2011, the Bureau was instructed to begin negotiations for the development of alternative technology facilities capable of processing post-source separated MSW utilizing alterative technologies including Advanced Thermal Recycling (ATR), gasification, anaerobic digestion, and composting.

It should be noted that ATR is a second-generation advancement of the waste-to-energy (WTE) technology in which MSW is converted, in an environment rich of oxygen, to a hot exhaust gas composed primarily of carbon dioxide and water vapor with inorganic material converted to bottom ash and fly ash, which can be beneficially used. The hot exhaust gas can be used to generate heat or steam to produce electricity. ATR is equipped with the most advanced pollution control technologies that effectively diminish air emissions to a much greater extent than its predecessors.

COMMENTS:

(1) Section 95852.2.(a) (7) Emissions without a Compliance Obligation, Municipal Solid Waste

Despite our highly successful recycling efforts, Californians still dispose an estimated 40 million tons of waste at landfills each year, according to the California Air Resources Board's 2009 Staff Report "Initial Statement of Reasons for the Proposed Regulation to Reduce Methane Emissions from Municipal Solid Waste Landfills." Approximately 70% of this landfilled waste is organic (57% biomass and 13% plastics/textiles) (R Williams, 2007). This abundant amount of organic waste is a potential source of energy for the state, which has a growing demand for renewable power. There has been increased interest from different municipalities in the state, including the City, regarding utilizing this feedstock for green power generation.

In California, MSW landfills are known to be the second largest anthropogenic source of methane (CH_4), a GHG that is 21 times more potent than carbon dioxide (CO_2). While most landfills are equipped with gas collection systems to capture roughly 60-90% of the CH_4 emitted, there are still fugitive emissions that are released to the atmosphere.

As previously mentioned, the Bureau has implemented a 4-bin collection system for residential, source-separated collections: blue (recyclables), green (yard trimmings), black

(refuse), and brown (manure). Although the City has achieved over 65% landfill diversion rate and will achieve zero waste, i.e. 80% diversion rate, by 2025, the City intends to implement other strategies to beneficially recover power from the 20% remaining waste. These strategies include alternative technologies to reduce its reliance on landfills. The Bureau's Alternative Technologies project is focusing only on the black bin waste (non-recyclables) that is otherwise destined for landfill disposal. The facilities under consideration are designed with a pre-processing system to remove plastics and other non-biogenic materials that are recyclable from the black bin content before the remaining is processed for energy recovery. In addition, the ash generated will be processed for beneficial reuse. It should be noted that the remaining portion for energy recovery is very close to 100% biogenic or mixed with a negligible portion of non-biogenic waste. Additionally, the City's Alternative Technologies facility(ies) convert 100% of the carbon-based materials into green power, which is captured for beneficial use while a regular landfill operation takes in MSW and has the potential to release fugitive emissions including CH_4, a more potent GHG than CO_2.

Assembly Bill 32, the Global Warming Solutions Act of 2006, calls for reduction of GHG emissions from many sectors, including electricity generation and solid waste management. It has been estimated that processing MSW through WTE rather than disposing it at a landfill ***reduces GHG emissions by 1.25 ton of CO_2 per ton of MSW processed*** *(J.K. O'Brien, 2010)*. In addition, in comparison to other fuel types, ***WTE facilities emit significantly less CO_2 than fossil fuel power plants*** since ***67% of the CO_2 emissions*** from WTE facilities ***are biogenic*** (Energy Recovery Council, 2009). Moreover, the U.S. EPA has indicated that after reduce, reuse, and recycling, technologies such as WTE provide a better alternative than landfilling for solid waste management.

In California, there are three operating WTE facilities for MSW, namely, the Commerce Refuse-to-Energy Facility (CREF, Commerce), the Stanislaus County Resource Recovery Facility (SRRF, Crow's Landing), and the Southeast Resource Recovery Facility (SERRF, Long Beach). These rule compliant facilities are conventional WTE facilities wherein the entire quantity of delivered MSW, except for white goods, is thermally treated. As a result, all of the non-biogenic materials are sources of CO_2 emissions. On the contrary, the City's Alternative Technology facility(ies) has a pre-processing system that will recover plastics and other non-biogenic materials from delivered MSW prior to it being processed for energy recovery. As a result, the remaining portion of the MSW for energy recovery is nearly 100% biogenic or mixed with a negligible portion of non-biogenic materials.

Therefore, the Bureau recommends that the California Air Resources Board (CARB) amend Section 95852.2. Emissions without a Compliance Obligation (a)(7) (A) Municipal Solid Waste, Direct Combustion, on page A-89, to not limit the exemption to only the biogenic fraction of the feedstock but include the entire MSW feedstock. In addition, Section 95852.2. Emissions without a Compliance Obligation (b) (s) should not be limited to only the

existing WTE facilities, but to also include new WTE facilities that can demonstrate that they can contribute toward achieving California's AB 32 goals set by the state legislature.

(2) Section 95852.2.(a) (7) (B) Emissions without a Compliance Obligation, Municipal Solid Waste, Conversion to a clean burning-fuel

The Bureau recommends that special consideration should be given to the conversion technologies that are identical or similar to that of the City's Alternative Technologies project due to the fact that the proposed facilities have a pre-processing system to remove plastics and other non-biogenic materials prior to processing for biofuel/bioenergy production, and to extend the exemption to the entire MSW feedstock processed by these facilities and not limited to just the biogenic fraction.

In addition, we are recommending the amendment of the current definition for conversion technology, which is technically inaccurate and practically infeasible to comply with, for the reasons discussed below:

First, "the *technology does not use air or oxygen in the conversion process, except ambient air to maintain temperature control.*" Existing gasification technologies known by the Bureau utilize limited supply of oxygen for the gasification of organic material to produce synthetic gas (syngas). Syngas is comprised of hydrogen (H_2) and carbon monoxide (CO) and can be used to generate electricity or produce transportation fuels.

Second, "*the technology produces no discharges of air contaminants or emissions, including greenhouse gases.*" It should be noted that all conversion technologies, including biological and thermal technologies, produce air emissions either during the biofuel generation process or when the syngas/biogas is used for electricity production. Consequently, all "conversion technologies" produce air emissions and must instead be required to be equipped with the Best Available Control Technology to mitigate emissions, and to meet or exceed all applicable requirements set by the local, state, and federal agencies.

The Bureau appreciates the opportunity to provide comments on the Revised Draft on California Cap Greenhouse Gas Emissions and Market-Based Compliance Mechanisms.

If there are any questions or further discussions are needed, please do not hesitate to contact Dr. Kim Tran of my staff at (213) 485-3522, email: kim.j.tran@lacity.org.

Sincerely,

ALEXANDER E. HELOU, P.E.
Assistant Director
Bureau of Sanitation