WATER RECLAMATION
SOLID WASTE MANAGEMENT

COUNTY SANITATION DISTRICTS
OF LOS ANGELES COUNTY

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STEPHEN R. MAGUIN
Chief Engineer and General Manager

September 27, 2011
File No.: 31-380.10

Clerk of the Board
California Air Resources Board
1001 I Street
Sacramento, California 95812-2815

Dear Ladies and Gentlemen:

Comments on the September 2011 Amendments to the Regulation for the Cap and Trade Program

The Sanitation Districts of Los Angeles County (Sanitation Districts) appreciate this opportunity to comment on CARB's Proposed Amendments to the Regulation for the Cap and Trade Program released on September 12, 2011. There are two main areas where we are providing comments, both related to § 95852.2 *Emissions without a Compliance Obligation*: 1) the exclusion of existing waste-to-energy facilities from cap and trade compliance obligations; and 2) the removal from this section, fugitive CH4 from landfills, and process/fugitive CH4 and N2O emissions from municipal wastewater treatment plants.

Existing Waste-to-Energy Facilities

CARB staff removed from the discussion draft of the 15-day amendments, released on July 8, 2011, language in § 95852.2 that excluded from compliance obligations, "*Direct combustion of municipal solid waste with energy recovery in an existing permitted facility.*" This exclusion was based upon a lifecycle analysis that demonstrated the net greenhouse gas (GHG) emissions benefit of operating waste-to-energy facilities compared to landfilling. CARB has now offered two alternate analyses drawing conclusions that caused reversal of their original decision. After thorough review of these analyses by our staff experts, we conclude the approaches used are not technically sound and the conclusions faulty. Both analyses focus on CARB's uncertainty with the landfill gas surface emissions and how long a landfill gas collection and control system (GCCS) would be operated post-closure. The first analysis used a hybrid landfill gas generation model which, based upon how CARB applied it, has been demonstrated to be technically flawed. This approach produced unrealistically high methane oxidation in the landfill cover under the no control (post-closure) scenario. It appears that CARB has backed off of this first approach; therefore, our comments will focus on CARB's second analysis.

Using two landfills examples (the Puente Hills and Fink Road Landfill), this new analysis utilizes a first order decay model to estimate how long it would take, post-closure, for landfill gas generation to reach a heat rate of 3 million BTUs per hour (MMBtu/hr). CARB has arbitrarily chosen this heat rate to define the time at which a landfill gas collection system could be turned off; approximately 260 years for the Puente Hills Landfill and 93 years for the Fink Road Landfill. CARB then plugged these new time estimates in a lifecycle analysis to conclude that landfilling produces less GHG emissions than combusting an equal amount of waste in a waste-to-energy facility.

We also have serious concerns with this approach. This analysis is based upon erroneous assumptions and a basic misunderstanding of how landfills operate. For example, the 3 MMBtu/hr trigger to determine when a landfill gas system can be turned off has no basis in regulation. The 3.0 MMBtu/hr standard applies only to § 95463, *Determination for Installing a Gas Collection and Control System.* Shutting systems down are governed by § 95467, *Permanent Shutdown and Removal of the Gas Collection and Control System.* As described in § 95467, a gas system that has been in place for at least 15-years, and the surface emission levels meet the 500/25 ppm standard, can be permanently taken out of service.

Using the 3.0 MMBtu/hr trigger at the Puente Hills Landfill, for example, would be equivalent to landfill gas flow rate of approximately 30 cfm of methane compared to the current day level of 10,000 cfm of methane; a small flow by any comparison. The question is then, would a landfill operator realistically wait until this low flow is reached (260 years out) to shut off their gas system. The answer is no for two reasons. First, landfill GCCS are not simply shut off, but would be phased out over time as opposed to CARB's reasoning that the GCCS is more like an "on/off switch." This is a key error in CARB's analysis. For instance, depending upon the amount of waste-in-place at a site, one area of a landfill could be currently active and producing significant amounts of landfill gas, while other areas of a site could have been closed for many years with landfill gas generation decreasing rapidly. Clearly, gas collection can be reduced or ceased in these older areas much sooner than the active areas of the landfills. In this example, which is very typical for most larger landfills, the collection system would be taken out of service over a period of many years.

The second reason is that the assumption of post-closure operation of the GCCS extending out 260 years is arbitrary and contradicts the language of existing regulations. As discussed above, § 95467 of CARB's landfill methane reduction rule allows the permanent shutdown and removal of the GCCS using a 15-year criteria coupled with surface emission levels. The USEPA NSPS for landfills also uses the 15-year criteria tied to overall NMOC levels in the landfill gas. In addition to these regulations, other federal and state regulations require financial assurance (FA) for post-closure. USEPA require post-closure care for 30 years, and the corresponding FA requirement is also for 30 years. Our own state agency, CalRecycle, adopted FA regulations that are more stringent than USEPA's. These regulations require the operator to submit a 30-year FA mechanism to the state at closure. The landfill operator has the ability to

lower their FA to a 15-year level if the operator participates in a Proactive Monitoring Program (PMP).

In these same CalRecycle regulations, there is also a requirement for the operator to set up a separate FA mechanism for non-water quality corrective actions, which would cover landfill gas migration issues among other things. Consequently, funding assurances are being provided for the long-term care of the landfill and for reasonably foreseeable corrective actions. Simply put, methane collection systems do not operate – and are not required or designed to operate – for anything approaching 260 years. Similarly, landfill operators are not required to set aside the massive amount of funding that would be necessary to satisfy such a requirement.

With so much regulatory focus on placing bounds on how long GCCS need to operate in the post-closure period, it is very clear that an analysis that would assume a full GCCS operating operating for a 260 year post-closure period is absurd, and not based in reality.

More Appropriate Estimation of Time to Turn Off the GCCS

Regulations couple a time-certain period with performance standards to define when a GCCS can be turned off. As discussed above, turning off a GCCS is not as simple as an "on/off switch", but is a very complex process that will span over many years. However, a performance parameter, such as surface concentrations of methane (a requirement to measure in CARB's landfill methane reduction regulation), can be used as a threshold to estimate the approximate time by which a GCCS can be turned off.

By using the CARB integrated surface standard of 25 ppm coupled with air dispersion modeling, a landfill gas generation model can be used to determine the approximate time into post-closure where the integrated surface levels will be no greater than 25 ppm (assuming no GCCS). This type of analysis establishes a reasonable expectation that if the GCCS is turned off, surface emissions would not exceed this level. The overall technique for performing this analysis is described more fully in the paper, "*Measuring Landfill Gas Collection Efficiency using Surface Methane Concentrations*"[1], which was also partially used by CARB in development of its landfill methane reduction regulation.[2] Sanitation Districts staff is available to review the exact methodology at your convenience.

The results of this analysis demonstrates that the Puente Hills Landfill will reach the 25 ppm integrated methane surface level in approximately 26 years post-closure, and the Fink Road Landfill in approximately 57 years. This conclusion is shown graphically in letter attachment.

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[1] Huitric and Kong, 2006, *Measuring Landfill Gas Collection Efficiency using Surface Methane Concentrations, SWANA2006 Landfill Gas Symposium*

[2] http://www.arb.ca.gov/regact/2009/landfills09/landfills09.htm, May 8, 2009 Material, Appendix D ~ Evaluation of Landfill Gas Collection Efficiency

Both these estimates provide a more reasonable, and expected, time by which a GCCS can be turned off. In addition, these estimates mirror the assumptions used in the original lifecycle approach used by CARB, which is the basis for the original exclusion language. Finally, even these results should be viewed as conservative since, for reasons explained above, landfills would phase out portions of their GCCS prior to the 26 and 57 years determined for the Fink Road and Puente Hills Landfill, respectively.

Conclusion

CARB has reversed an earlier decision to exclude existing waste-to-energy facilities from the AB32 Cap and Trade Program because of concerns over lifecycle analysis assumptions that originally supported this exclusion; however, we believe these concerns to be unsupported. The uncertainty expressed by CARB focused on landfill methane surface emissions post-closure with no GCCS. CARB used two approaches to support their decision to reverse the exclusion; the first based upon a hybrid model of gas generation to determine lifetime fugitive landfill emissions, and the second, use of a landfill gas generation model with an arbitrary trigger of when a landfill gas GCCS could be removed.

Based upon our review and subsequent meetings, CARB appears to have backed off on the first approach because of demonstrated technical problems with the analysis, but gave our staff little time to respond to the second approach. A more thorough analysis, detailed in this submittal, clearly demonstrates that when a suitable modeling approach is used to estimate when a GCCS will be removed, the resulting time frames fall within those contained in the original analysis on which CARB previously made its decision to exclude the existing waste-to-energy facilities. On this basis, we request the exclusion language be re-inserted in § 95852.2.

Removals from § 95852.2 Fugitive CH4 from Landfills, and CH4 and N2O from Municipal Wastewater Treatment Plants

Streamlining the federal mandatory reporting program with the state program caused some unintended consequences. The federal program requires the estimation and reporting of fugitive CH4 emissions from landfills. When the two programs were combined, this estimation now had the unintended effect of drawing landfills into the cap and trade program. In December 2010, staff introduced language in § 95852.2 at the Board meeting of that month, excluding fugitive CH4 from landfills. In the most recent 15-day package the language was removed from this section, but the exclusion was introduced into the state mandatory reporting regulation, as an exclusion of landfill reporting, from state reporting requirements, as defined in the specific section cited in the federal regulations,. This in effect would currently exclude landfills from the cap and trade program, but not fully protect them into the future.

Future changes in federal regulations could potentially cause this problem to re-occur. More importantly though, when CARB decided to regulate landfills under the Early Action

Measures, it was with the understanding and full cooperation of the landfill industry, that this action was in place of including landfills in the cap and trade program. The landfill industry worked with CARB to promulgate the most stringent landfill regulation in the world on that basis. In the spirit of that understanding, landfills should receive a full exclusion from the cap and trade program. We therefore recommend that the original language, "*CH4 from landfills*", be re-inserted back in § 95852.2 under *fugitive and process emissions*. This action would not only be consistent with the understanding reached when the Early Action Measures were adopted, but also avoids any unintended consequences of changes to federal mandatory reporting regulations.

With similar concerns that future revisions to the federal mandatory reporting program could require reporting of fugitive/process CH4 and N2O emissions from municipal wastewater treatment plants, and inadvertently draw these facilities into the state cap and trade program, staff agreed to proactively include exclusion language in § 95852.2 for these emissions (language introduced during the December 2010 Board meeting). This action was prudent to avoid having to re-open the rule in the future.

In conversations with staff questioning the removal of this language, they were unaware of the original purpose for including them. We therefore, recommend that the language "*CH4 and N2O from Municipal Wastewater Treatment Plants*", be re-inserted back in § 95852.2 under *fugitive and process emissions*.

We appreciate the opportunity to comment on the 15-day changes. Please contact the undersigned with any questions or comments regarding this submittal.

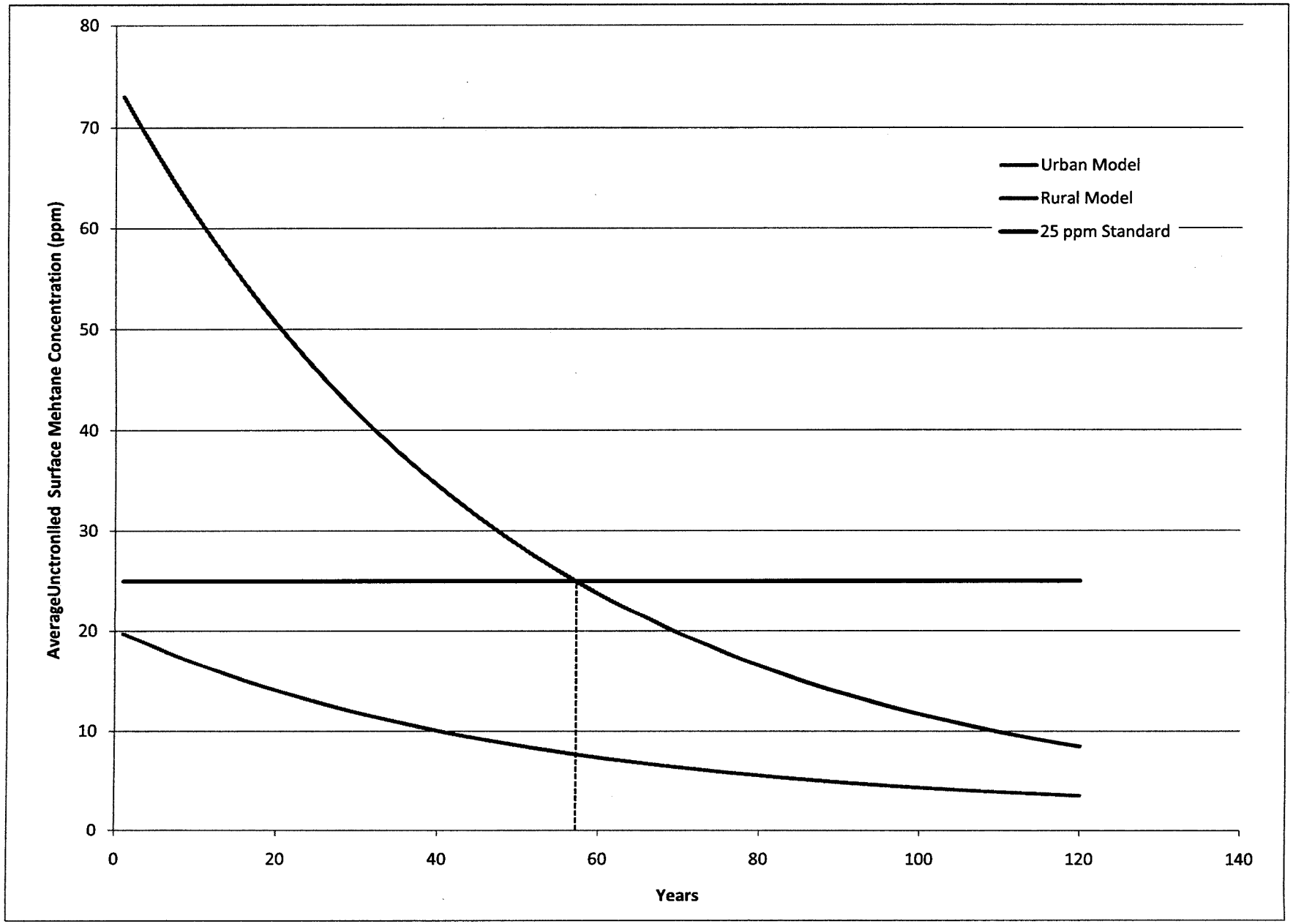
Very truly yours,

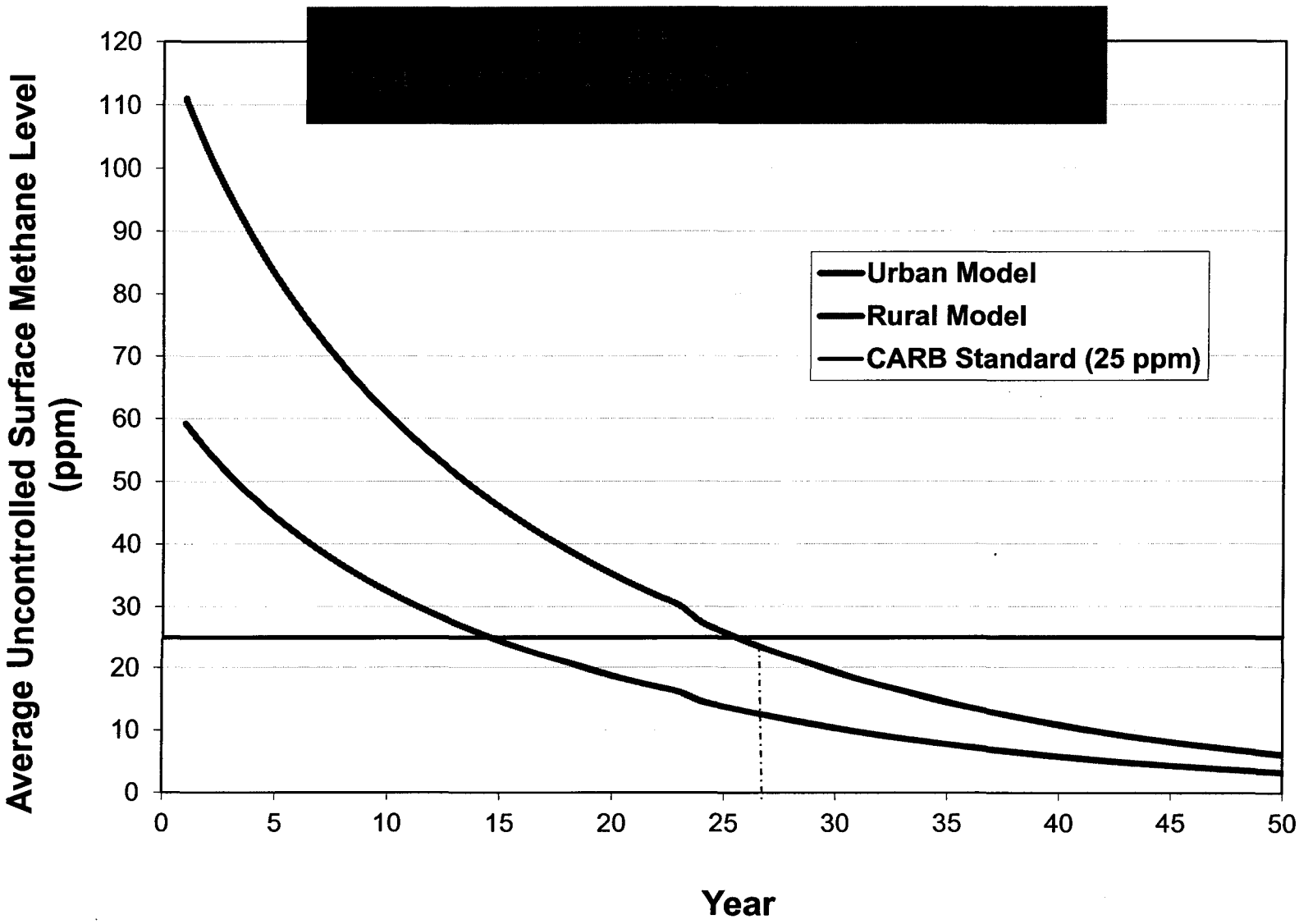
Stephen R. Maguin

Frank R. Caponi
Supervising Engineer
Air Quality Engineering
Technical Services Department

FRC:bb

FINK ROAD LANDFILL:
TIME TO REACH 25 PPM SURFACE EMISSION LEVEL




Average Uncontrolled Surface Methane Level (ppm)
120
110
100
90
80
70
60
50
40
30
20
10
0
0
5
10
15
20
25
30
35
40
45
50
Year
Urban Model
Rural Model
CARB Standard (25 ppm)